ORDER NO. RD81081902C2

Service Manual

Car Audio

RM-310

Overhead Console Type Hi-Fi Car Audio System

General

Power Source:	DC 12 V (11–16 V usable) Negative ground only
Test Voltage:	14.4 V
Power Consumption:	4.5A at rated power output
Dimensions:	708 (L)×219 (W)×41 (D) mm (27$\frac{7}{8}$''×8$\frac{5}{8}$''×1$\frac{5}{8}$'') Cassette Deck Section Depth 68 mm (2$\frac{11}{16}$'')
Weight:	3.6 kg (7 lb 15 oz)

FM Tuner Section

Frequency Range:	88–108 MHz
Usable Sensitivity:	16 dBf (1.7 μV/75 ohms)
50 dB Quieting Sensitivity:	18 dBf (2.2 μV/75 ohms)
Signal to Noise Ratio:	73 dB (A-Weighted)
Image Rejection:	60 dB
IF Rejection:	95 dB
RF IMD Rejection:	80 dB
Frequency Response:	30–15,000 Hz (±3 dB)
Stereo Separation:	35 dB at 1,000 Hz

AM Tuner Section

Frequency Range:	525–1610 kHz (571∼186m)
Max. Sensitivity:	23 dB (at 500 mW output)
Selectivity:	35 dB (±10 kHz)

Cassette Deck Section

Wow and Flutter:	0.15% (WRMS)
Cross-Talk:	55 dB
Signal to Noise Ratio:	55 dB (A-Weighted)
Frequency Response:	45–12,000 Hz (±3 dB)
Stereo Separation:	40 dB at 1,000 Hz

Audio Amplifier Section

Rated Power Output:	(2 CH) 10 Watts per channel minimum continuous average power into 4 ohms, both channels driven, from 30 to 20,000 Hz with no more than 1% total harmonic distortion. (4 CH) 4 Watts per channel minimum continuous average power into 4 ohms, all channels driven, from 60 to 20,000 Hz with no more than 5% total harmonic distortion.
Max. Power Output:	(2 CH) Total 46 Watts RMS 23 Watts per channel (4 CH) Total 28 Watts RMS 7 Watts per channel
Distortion:	(2 CH) 0.25% at −3 dB at Rated Power, 1,000 Hz
Frequency Response:	(2 CH) 15 to 20,000 Hz, ±3 dB at 1 Watt
Signal to Noise Ratio:	(2 CH) 80 dB (A-Weighted)
Tone Control:	50 Hz ±10 dB 250 Hz ±6 dB, −10 dB 10 kHz ±10 dB
Loudness:	100 Hz +8 dB

Specifications are subject to change without notice.

Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka, Japan

SPECIAL FEATURES

Tuner Section

- FM/AM/FM Stereo Tuner
- Tuning Optimizer LED Indicators
- FM Stereo Auto/Mono Switch and Stereo Indicator
- DX/Local Sensitivity Selector
- Muting Circuit on FM
- Built-in INQ (Impulse Noise Quieting) Circuit
- 3 Station Guides on Tuning Dial

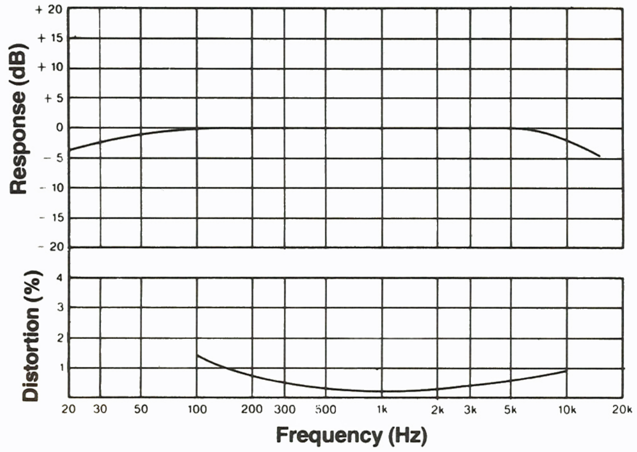
Cassette Deck Section

- Repeatrack Cassette Player System
- Locking Fast forward and Rewind
- Auto Eject System when Ignition Key is Off

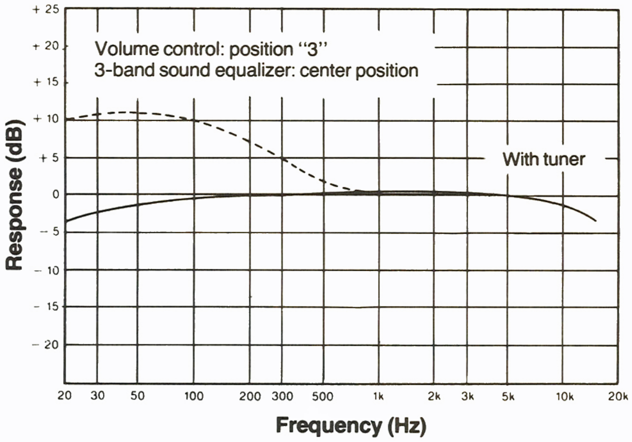
Audio Amplifier Section

- 3-Band Sound Equalizer with Center- detent
- 10 LED Output Power Indicator
- Balance and Fader Controls with Center-detent
- Loudness and High filter Switches
- Volume Control with 21 Detents
- Power Amplifier built into Console Unit
- 20 Watts (RMS) Total Output Power

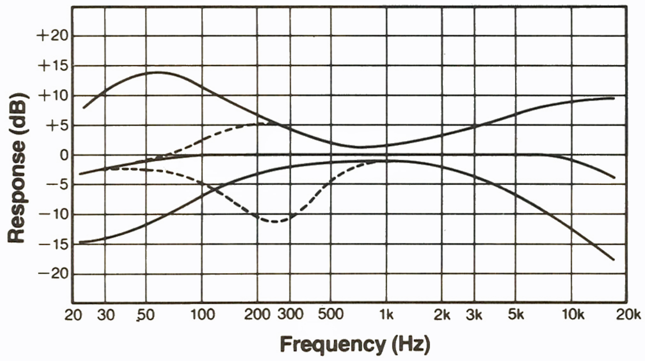
FM tuner frequency response



Loudness frequency response



3-band sound equalizer frequency response



CONTROLS AND FUNCTIONS

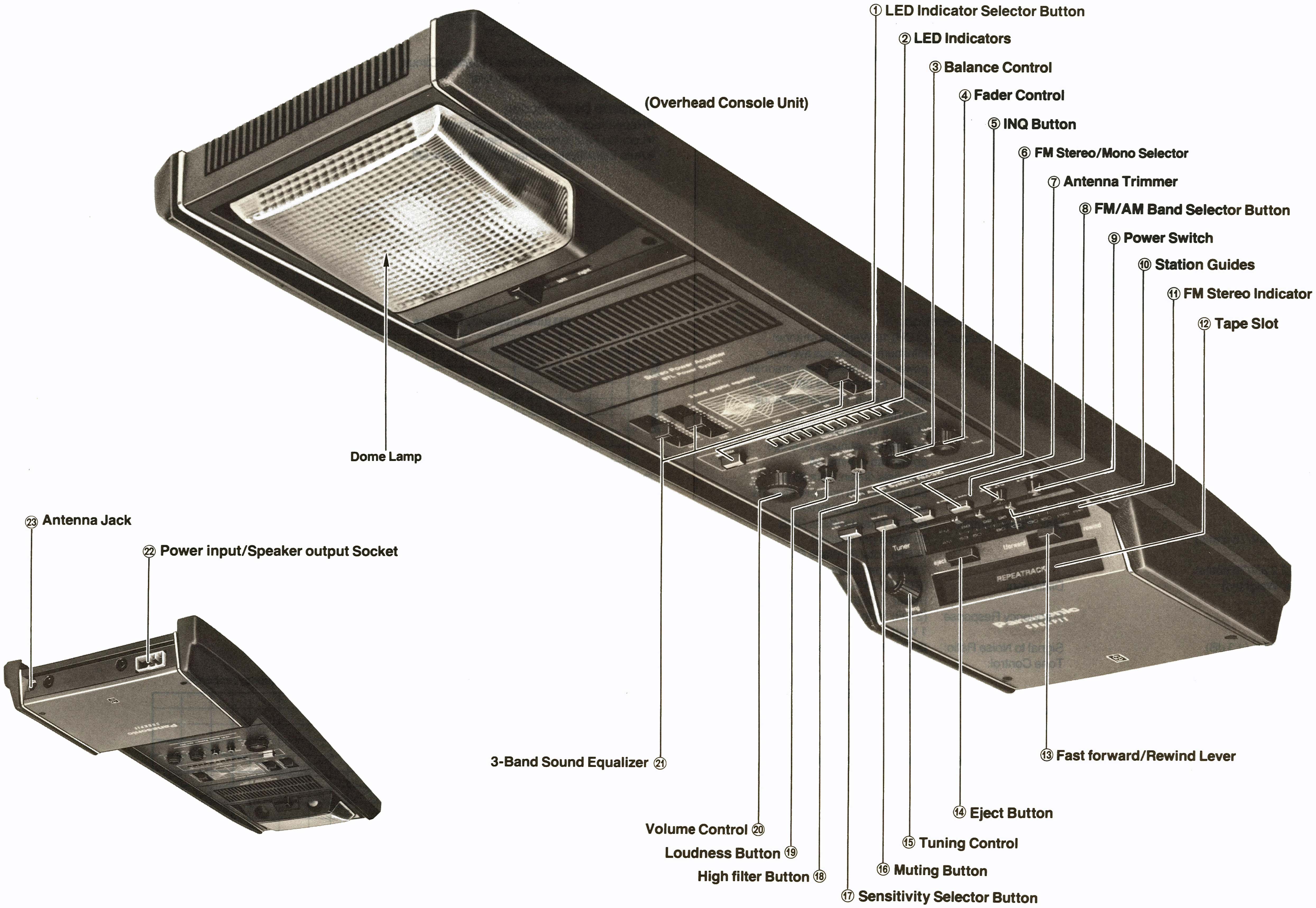

(Overhead Console Unit)
① LED Indicator Selector Button
② LED Indicators
③ Balance Control
④ Fader Control
⑤ INQ Button
⑥ FM Stereo/Mono Selector
⑦ Antenna Trimmer
⑧ FM/AM Band Selector Button
⑨ Power Switch
⑩ Station Guides
⑪ FM Stereo Indicator
⑫ Tape Slot
Dome Lamp
㉓ Antenna Jack
㉒ Power input/Speaker output Socket
3-Band Sound Equalizer ㉑
⑬ Fast forward/Rewind Lever
⑭ Eject Button
⑮ Tuning Control
⑯ Muting Button
⑰ Sensitivity Selector Button
Volume Control ⑳
Loudness Button ⑲
High filter Button ⑱

Fig. 1

① LED indicator selector button

- For tape play set this button to "level" (■).
  The output level of the left and right speakers is indicated by the flashing of the LED indicators ②. When the button is set to the "tuning" (▬), only the center section (red) lights.
- For radio reception, first set the button to "tuning" (▬) and then tune in the station. If the button is set to "level" (■) after tuning, the output level will be indicated by the flashing of the LED indicators just as with tape play.

② LED indicators

These indicators are coupled with the LED indicator selector button ① and it lights as follows.

●Tape playback

LED indicator selector button ①	Lighting mode
level (■)	This always lights. ↓ ▣ ▣ ▣ ▣ ▣ ○ ▣ ▣ ▣ ▣ ▣ These light in accordance with output level strength.

●Radio reception

LED indicator selector button ①	Lighting mode
level (■)	Lights only during reception. ↓ ▣ ▣ ▣ ▣ ▣ ○ ▣ ▣ ▣ ▣ ▣ These light in accordance with output level strength.
tuning (▬)	This lights when tuning. ↓ ▣ ▣ ▣ ▣ ▣ ○ ▣ ▣ ▣ ▣ ▣ These light if tuning shifts to the left. These light if tuning shifts to the right. Rotate Tuning Control ⑮ and adjust so that center red indicator only lights.

③ Balance control

When this control is turned to the left, the sound volume heard through the left speaker increases and when turned to the right, the sound volume heard through the right speaker increases. The sound heard through both the left and right speakers is the same when the control is set to its center detent position.

④ Fader control

When using a 4-speaker system, use this control to attain a balance of sound between the front and the rear speakers.
Make sure that the control is set in the center position if you have only a 2-speaker system.

⑤ INQ button

Use this button to suppress ignition and pulse-like noise.
If the signals are weak, set the button to "off".

⑥ FM stereo/mono selector button

- Depress this button to set it in the "auto st" position (LED lights up), for normal operation.
  A stereo program will be automatically come through in stereo and a mono program will be automatically come through in mono.
- If the signals from the broadcasting station are weak, set the button to "mono" (LED goes off) in order to reduce the amount of noise. In such cases, a stereo program is also heard in mono and the FM Stereo indicator ⑪ does not light up.

⑦ Antenna trimmer

This is the antenna trimmer for AM reception only. After installing and connecting it, adjust it optimally.

⑧ FM/AM band selector button

Set this button to your desired radio band; FM or AM.

⑨ Power switch

Depress this button to "on" (▬), power is supplied to all the components except the cassette deck.
Cassette deck power comes on when tape is inserted.

⑩ Station guides

Move the guides and preset them to the positions on the tuning dial where your favorite stations are located. They will then help you to tune in the stations more easily.

⑪ FM stereo indicator

This lights up when the FM stereo/mono selector button ⑥ is set to "auto st" and when a stereo broadcast is received.
When the FM stereo/mono selector button is set to "mono", the indicator will not light up even when a stereo broadcast is being received, and the stereo broadcast will be received in mono.

⑫ Tape slot

Insert the cassette tape into this slot. Make sure that the exposed side of the tape is inserted first.

⑬ Fast forward/rewind lever

●Fast forward

Move the lever to the left (f. forward). When the tape has been wound forward at high speed, and reaches it's end it will be automatically ejected.

●Rewind

Move the lever to the right (rewind). When the tape is rewound to it's beginning, tape play will start automatically.

⑭ Eject button

Depress this button to eject the cassette tape. The tape will then be automatically ejected and the power switched off. However, if the Power switch ⑨ is set to "on", operation will be automatically switched over to radio operation.

⑮ Tuning control

Use this control to tune in your favorite stations. When a station has been tuned in properly, only the center (red) part of the LED indicator ② lights. (LED indicator selector button "tuning").

⑯ Muting button

Use this to suppress interstation noise (noise heard between FM broadcasting stations).

⑰ Sensitivity selector button

Keep this button normally in the "DX" (■) position.
In areas where the signals are strong, the sound may be distorted or there may be interference. In this case, set the button to "local" (▬).

⑱ High filter button

Set this button to "on" (▬) when playing back a tape which has been recorded with the Dolby system and when a reduction in the amount of tape hiss and other high-frequency range noise is desired.

⑲ Loudness button

At low volume levels, the response of the human ear primarily in the mid range area, and response to low frequency is poor. As the volume level increases the response levels off, and the low and mid range are heard with equal loudness. The loudness control in this unit is designed to compensate for this human deficiency, by boosting the bass end of the audio spectrum at low volume levels, and gradually diminishing the boost as the volume control is advanced. At a volume control setting of 5 or higher the frequency response is essentially flat.

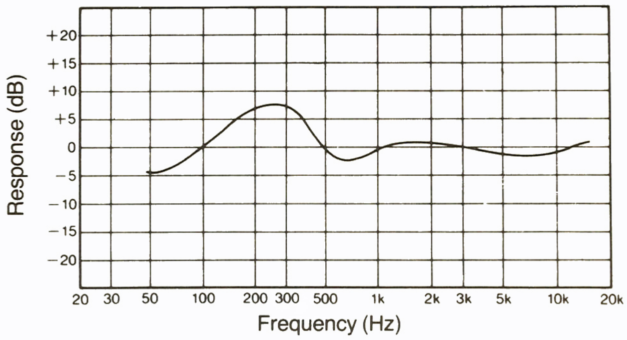
⑳ Volume control

Use this to adjust the volume to the preferred level.

㉑ 3-band sound equalizer

Use this to adjust the sound to the tone quality of your preference, bearing in mind that the acoustics inside a vehicle differ according to the interior decor and other factors.
When each of the knobs is slid toward "+", the sound is emphasized and when slid toward "−", the sound is reduced. Normally, the acoustic response inside a vehicle is such that the frequencies neighboring 250 Hz tend to be emphasized and the bass sound uncontrolled. In cases like this, move the "250 Hz" control toward "−" and once this imitation bass sound is reduced, the real bass will appear to be balanced.

Usual in-car sound transmission characteristics



㉒ Power input/Speaker output Socket

Plug in the supplied inter connection harness. These are used to connect the overhead console unit's power input, and also for the speaker output cords.

㉓ Antenna Jack

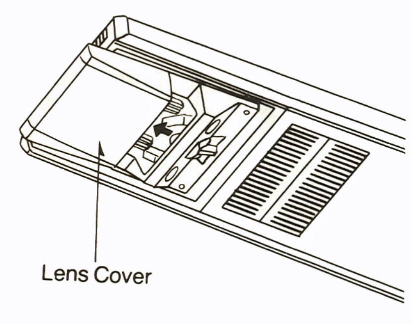
Plug in the supplied antenna lead plug and connect its to car antenna.

Power amplifier protection circuit

The power amplifier contains a protection circuit to safeguard the unit from damage.
It cuts off the main amplifier's circuits automatically, when the speaker leads or terminals are shorted. (The FM/AM tuner, cassette deck and preamplifier continue to function normally.)
If there is no sound even when the Volume control ⑳ is rotated clockwise and the LED indicator ② lights up, this circuit may have been actuated. Switch the power off and check the speaker connections before switching the power on again.

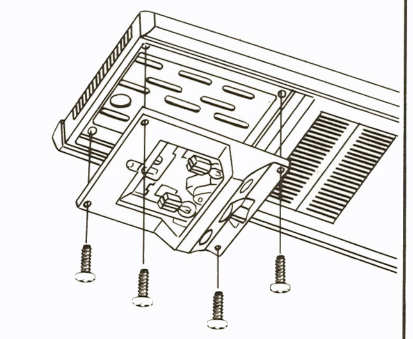
HOW TO REMOVE OVER-HEAD CONSOLE UNIT FROM THE ROOF

①



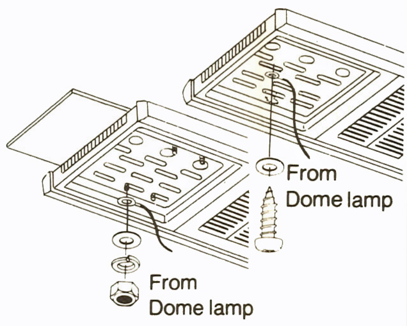
Remove Dome lamp lens cover.

②



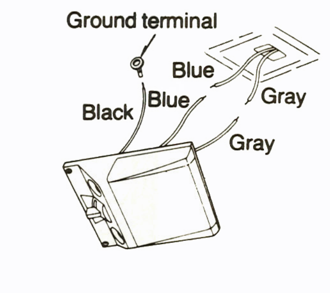
Remove Dome lamp from the console unit.

③


From
Dome lamp
From
Dome lamp

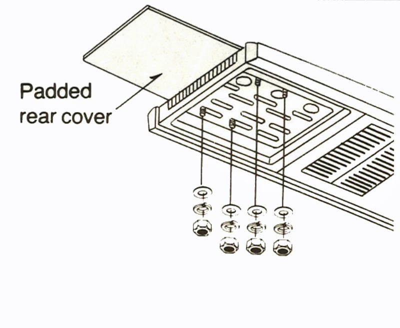
Remove the ground terminal from the rear mounting plate.

④


Ground terminal
Blue
Blue
Black
Gray
Gray

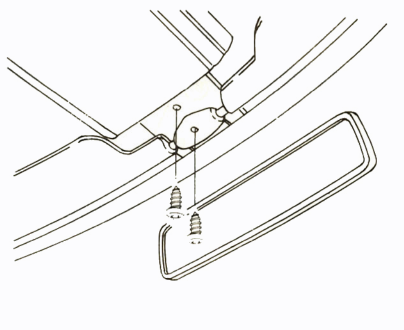
Remove the wires.

⑤


Padded
rear cover

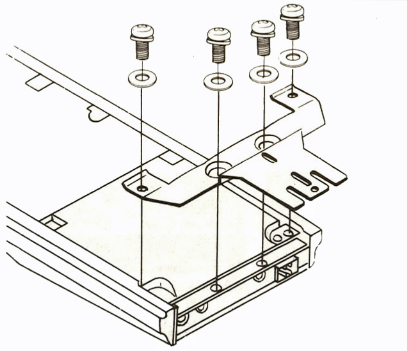
Remove the console unit from the mounting studs of the Rear extension plate.

⑥



Remove screws from the sunvisor support.

⑦



Remove the Front mounting plate from the console unit.

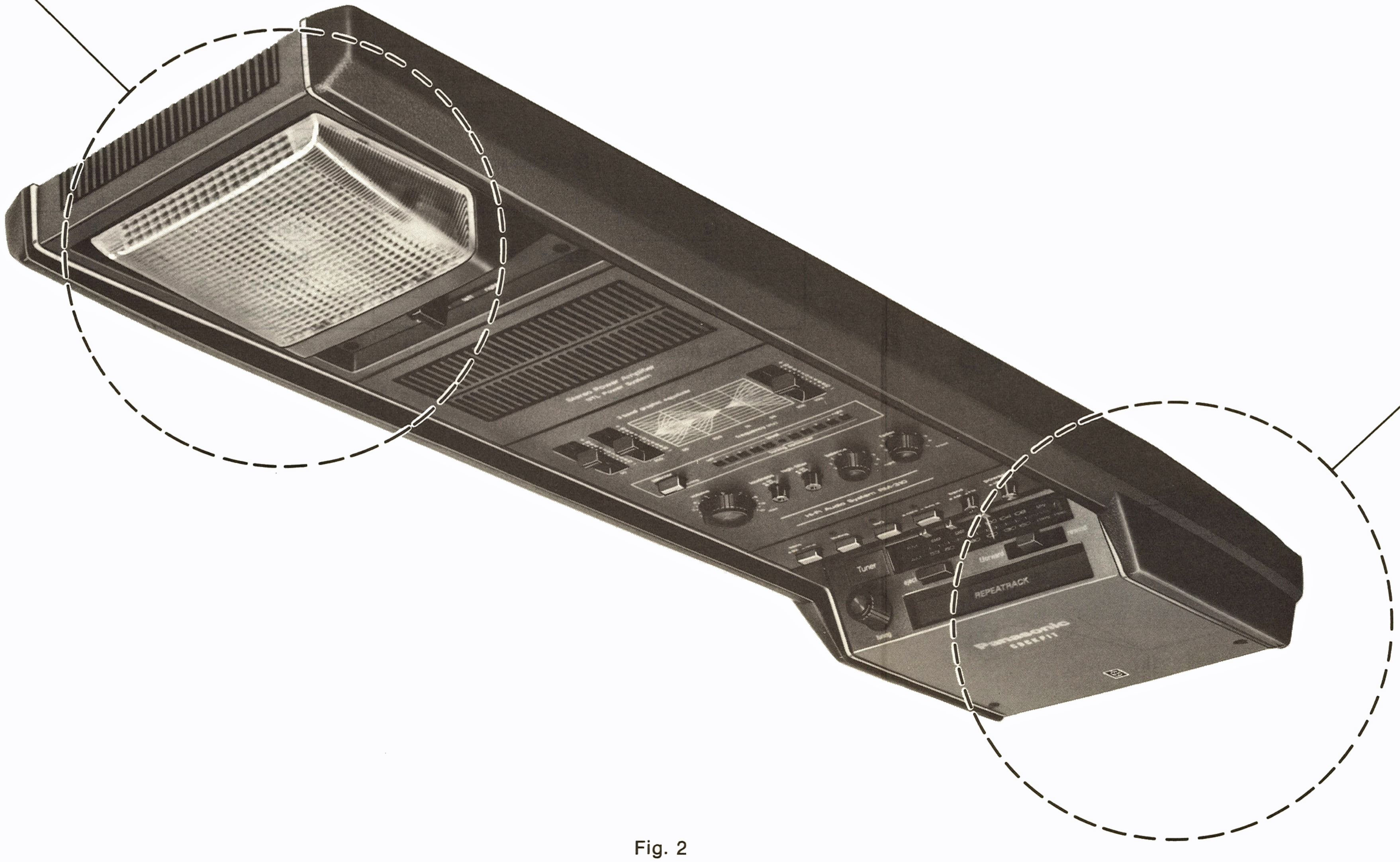

REPEATRACK
Panasonic
Tuner

Fig. 2

DISASSEMBLY INSTRUCTIONS

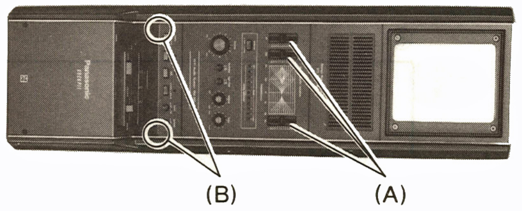


Fig. 3

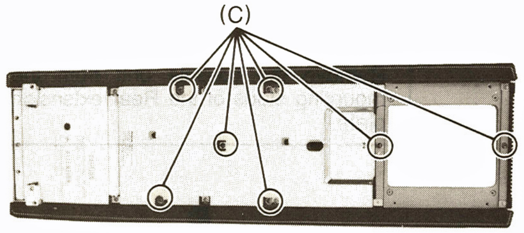


Fig. 4

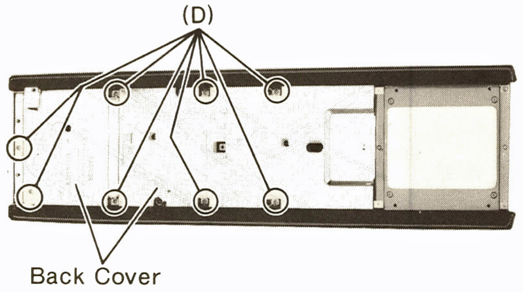

(D)
Back Cover

Fig. 5

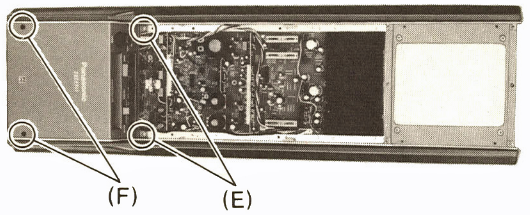


Fig. 6

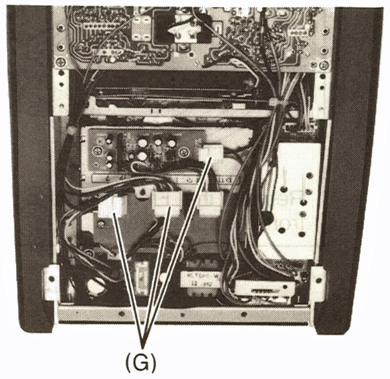


Fig. 7

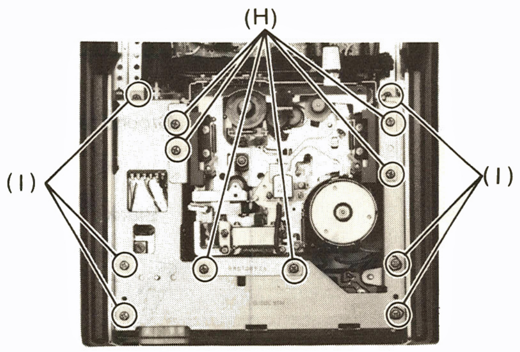


Fig. 8

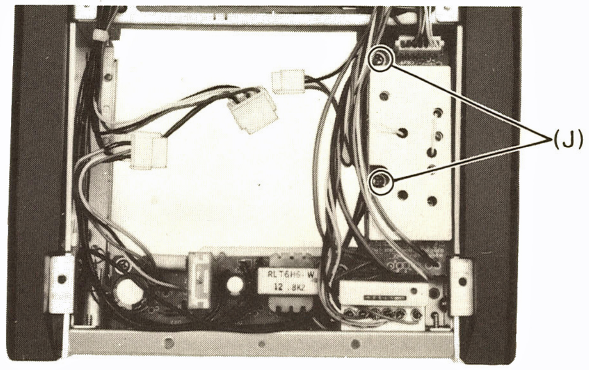


Fig. 9

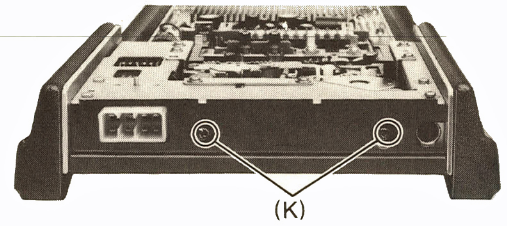


Fig. 10

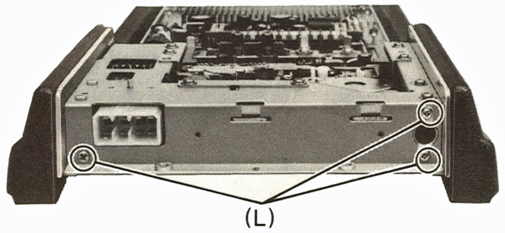


Fig. 11

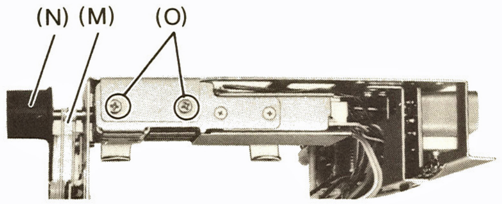


Fig. 12

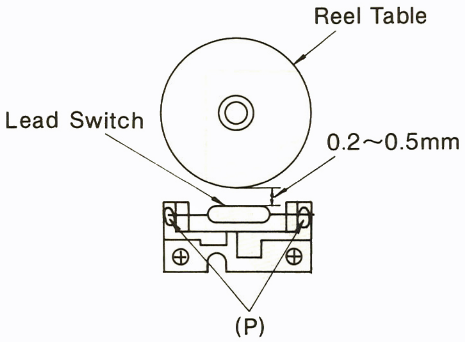

Reel Table
Lead Switch
0.2～0.5mm
(P)

Fig. 13

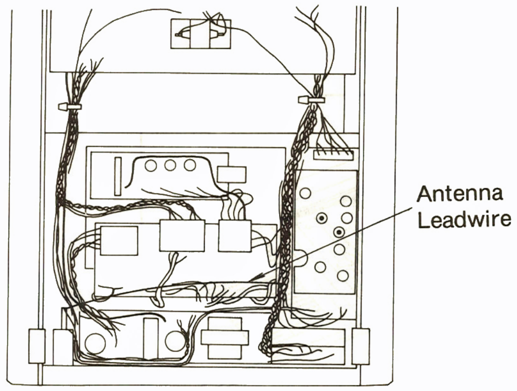

Antenna Leadwire

Fig. 14

Procedure	To remove—.	Remove—.	Shown in Fig.—.
1	Front Panel, Deck Cover and Back Cover	Knobs ....(A)×3	3
2		Screws (3×16) ....(B)×2	3
3		Red Screws (3×12) ...(C)×7	4
4		Screws (3×6) ....(D)×8	5
5		Red Screw (3×8) ......(E)×2	6
6		Screw (3×10) ....(F)×2	6
7	Cassette Deck ※1	Sockets ....(G)×3	7
8		Red Screws (3×6) ......(H)×6	8
9	Dial Chassis	Screws (3×8) ....(I)×6	8
10		Screws (3×6) ....(J)×2	9
11		Screws (3×8) ....(K)×2	10
12		Screws (3×8) ....(L)×3	11
13	Tuner ※2	Dial Cord ....(M)	12
14		Knob ....(N)×1	12
15		Screws (3×5) ....(O)×2	12
16	Lead Switch ※3	Unsolder ....(P)×2	13

※1. Please treat the leads as shown in Fig. 14.
※2. Refer to dial threading.
※3. Keep a gap (0.2～0.5 mm) as shown in Fig. 13.

DIAL THREADING

Note: Cord length is 397mm (15¾'').

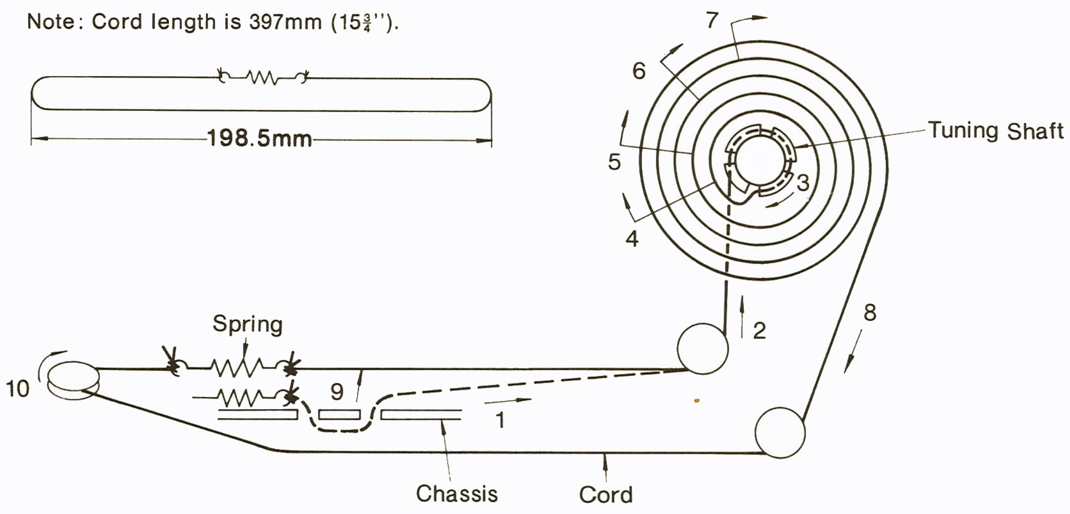
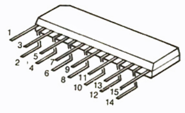
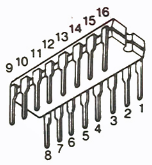
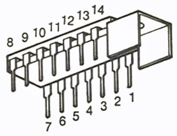
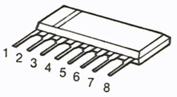
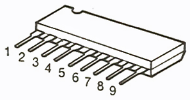
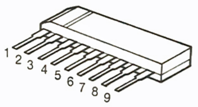
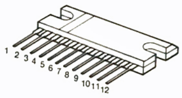
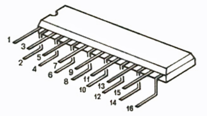
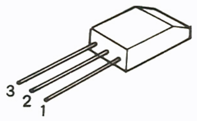
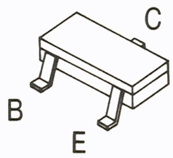
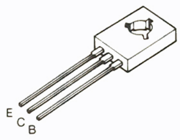
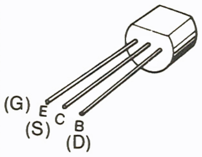
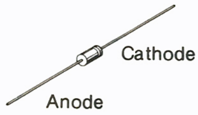
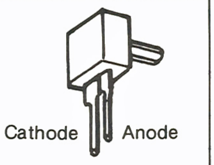
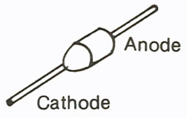

198.5mm
7
6
5
3
4
Tuning Shaft
2
8
Spring
10
9
1
Chassis
Cord

Fig. 15

Reference:
Relation between terminal voltages of INDICATOR AMP, IC4 (IC5) and illuminated order of LED level meter.

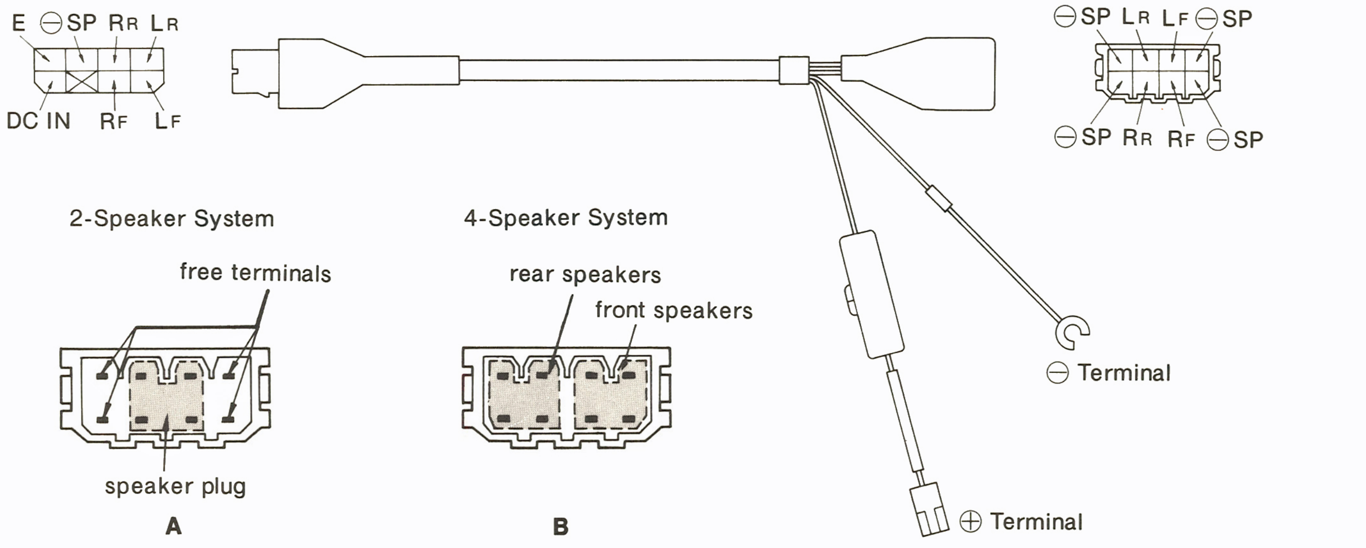
Illuminated order of LED		D_{12} (D_{18})	D_{11} (D_{17})	D_{10} (D_{16})	D_{9} (D_{15})	D_{8} (D_{14})
Terminal voltage of IC4 (IC5)	② in mV (input)	10	18	32	44	62
	⑨ in V	2.5	2.5	2.5	2.5	2.5
	⑩ in V	0	2.5	2.5	2.5	2.5
	⑪ in V	0	0	2.5	2.5	2.5
	⑫ in V	0	0	0	2.5	2.5
	⑬ in V	0	0	0	0	2.7
Output power in W		0.05	0.16	0.5	1	2

Each value shown in above table is merely a guide.

 1 2 3 4 5 6 7 8 9 10 11 12 13 14 IC1	 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 IC2,3	 14 13 12 11 10 9 8 7 6 5 4 3 2 1 IC4,5	 IC6	 IC7
 IC8	 1 2 3 4 5 6 7 8 9 10 11 12 IC9,10	 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 IC11	 IC12	 Q1~9,11~17
 Q10	 Q18,19,30~32	 Cathode Anode D1,2,7,19~22,25,26, 30~32	 Cathode Anode D3,4,5,8~18,33,34	 Anode Cathode D23

Notes:

1. S_{1-1}~S_{1-4}: Power switch for tape deck in "OFF" position.
2. S_{2-1}, S_{2-2}: Power switch for tuner in "OFF" position.
3. S_{3-1}, S_{3-2}: Sensitivity selector switch in "DX" position.
4. S_{4-1}, S_{4-2}: Muting switch in "OFF" position.
5. S_{5-1}, S_{5-2}: INQ switch in "OFF" position.
6. S_{6-1}, S_{6-2}: Stereo auto switch in "OFF" position.
7. S_{7-1}, S_{7-2}: Loudness switch in "OFF" position.
8. S_{8-1}, S_{8-2}: High-filter switch in "ON" position.
9. S_{9-1}, S_{9-2}: Meter selector switch in "Level" position.
10. S_{10-1}, S_{10-2}: Band selector switch in "FM" position.
11. S_{11}: Eject switch in "OFF" position.
12. S_{12}: Relay switch in "OFF" position.
13. DC voltage measurements are taken with electronics voltmeter from between measured parts and ground.


E
⊖SP
RR
LR
DC IN
RF
LF
⊖SP
LR
LF
⊖SP
⊖SP
RR
RF
⊖SP
2-Speaker System
free terminals
speaker plug
A
4-Speaker System
rear speakers
front speakers
B
⊖ Terminal
⊕ Terminal

BLOCK DIAGRAM

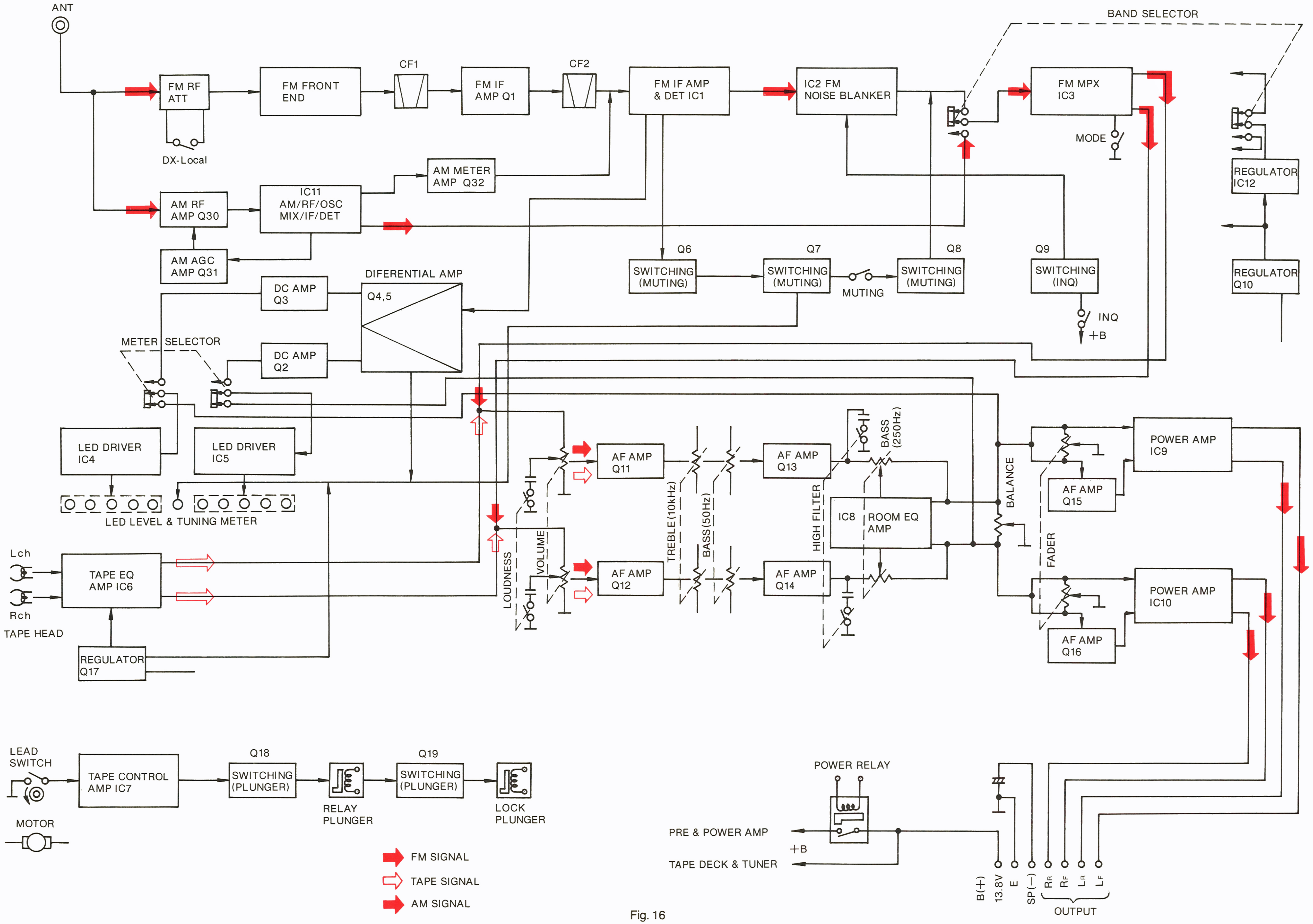

ANT
FM RF ATT
DX-Local
FM FRONT END
CF1
FM IF AMP Q1
CF2
FM IF AMP & DET IC1
IC2 FM NOISE BLANKER
BAND SELECTOR
FM MPX IC3
MODE
REGULATOR IC12
REGULATOR Q10
AM RF AMP Q30
IC11 AM/RF/OSC MIX/IF/DET
AM METER AMP Q32
AM AGC AMP Q31
DC AMP Q3
DC AMP Q2
DIFERENTIAL AMP
Q4,5
Q6
SWITCHING (MUTING)
Q7
SWITCHING (MUTING)
MUTING
Q8
SWITCHING (MUTING)
Q9
SWITCHING (INQ)
INQ
+B
METER SELECTOR
LED DRIVER IC4
LED DRIVER IC5
LED LEVEL & TUNING METER
Lch
Rch
TAPE HEAD
TAPE EQ AMP IC6
REGULATOR Q17
LOUDNESS
VOLUME
AF AMP Q11
AF AMP Q12
TREBLE(10kHz)
BASS(50Hz)
AF AMP Q13
AF AMP Q14
HIGH FILTER
BASS (250Hz)
IC8 ROOM EQ AMP
BALANCE
FADER
POWER AMP IC9
AF AMP Q15
POWER AMP IC10
AF AMP Q16
LEAD SWITCH
MOTOR
TAPE CONTROL AMP IC7
Q18
SWITCHING (PLUNGER)
RELAY PLUNGER
Q19
SWITCHING (PLUNGER)
LOCK PLUNGER
POWER RELAY
PRE & POWER AMP
+B
TAPE DECK & TUNER
B(+)
13.8V
E
SP(−)
R_R
R_F
L_R
L_F
OUTPUT
FM SIGNAL
TAPE SIGNAL
AM SIGNAL

Fig. 16

■ TUNER ALIGNMENT

1. Set power switch to on.
2. Set sensitivity switch to DX.
3. Set stereo auto switch off or on...(separation alignment only)
4. Set muting switch to off or on...(pilot alignment only)
5. Set INQ switch to off.
6. Set band switch to AM or FM.
7. Set loudness switch to off.
8. Set high-filter switch to off.
9. Set selector switch to tuning.
10. Set equalizer to center.
11. Set balance and fader to center.
12. Set volume to 500 mW.
13. Set power source voltage to 13.8 V DC.

AM ALIGNMENT (See Figs. 17, 18)

SIGNAL GENERATOR or SWEEP GENERATOR		DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
CONNECTIONS	FREQUENCY				
Positive side to point ▼7.	455 kHz	Point of non-interference.	Positive side to point ▼8. Netagive side to point ▼2.	T_{802} (IFT) T_{803} (IFT)	① Pull out T_{803} to the top of bobbin. ② Adjust T_{802} so that 455 kHz marker appears at the center. (Refer to Fig. 20.) ③ Adjust T_{803} for maximum amplitude.
AM-RF ALIGNMENT					
Connect to antenna terminal through AM dummy antenna (Refer to Fig.19.)	520 kHz	Minimum frequency.	Output meter across speaker voice coil.	T_{801} (OSC Coil)	Adjust for maximum output.
〃	1400 kHz	Tune to signal.	〃	CT_{801} (Ant. Trim.) CT_{803} (Ant. Trim.) CT_{804} (Ant. Trim.)	① Set CT_{801} to center. ② Adjust CT_{803} and CT_{804} for maximum output.
〃	1680 kHz	Maximum frequency.	〃	CT_{802} (OSC Trim.)	Adjust for maximum output.

FM ALIGNMENT (See Fig. 17)

SIGNAL GENERATOR or SWEEP GENERATOR		DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
CONNECTIONS	FREQUENCY				
FM-IF & DETECTOR ALIGNMENT					
Apply signal thru. 0.001μF to point ▼4 ground of SG to point ▼2.	10.7 MHz (400 kHz SWP.)	Point of non-interference. (on/about 90 MHz).	Connect vert. amp. of scope to point ▼1.	T_{101}	① Set VR_{21} minimum. ② Pull out T_2 and confirm that wave form should be normal. ③ Adjust for maximum amplitude and proper linearity between ±100 kHz markers. (Refer to Fig. 20.)
〃	〃	〃	〃	T_2	Adjust T_2 so that 10.7 MHz marker appears at the center. (Refer to Fig. 21.)

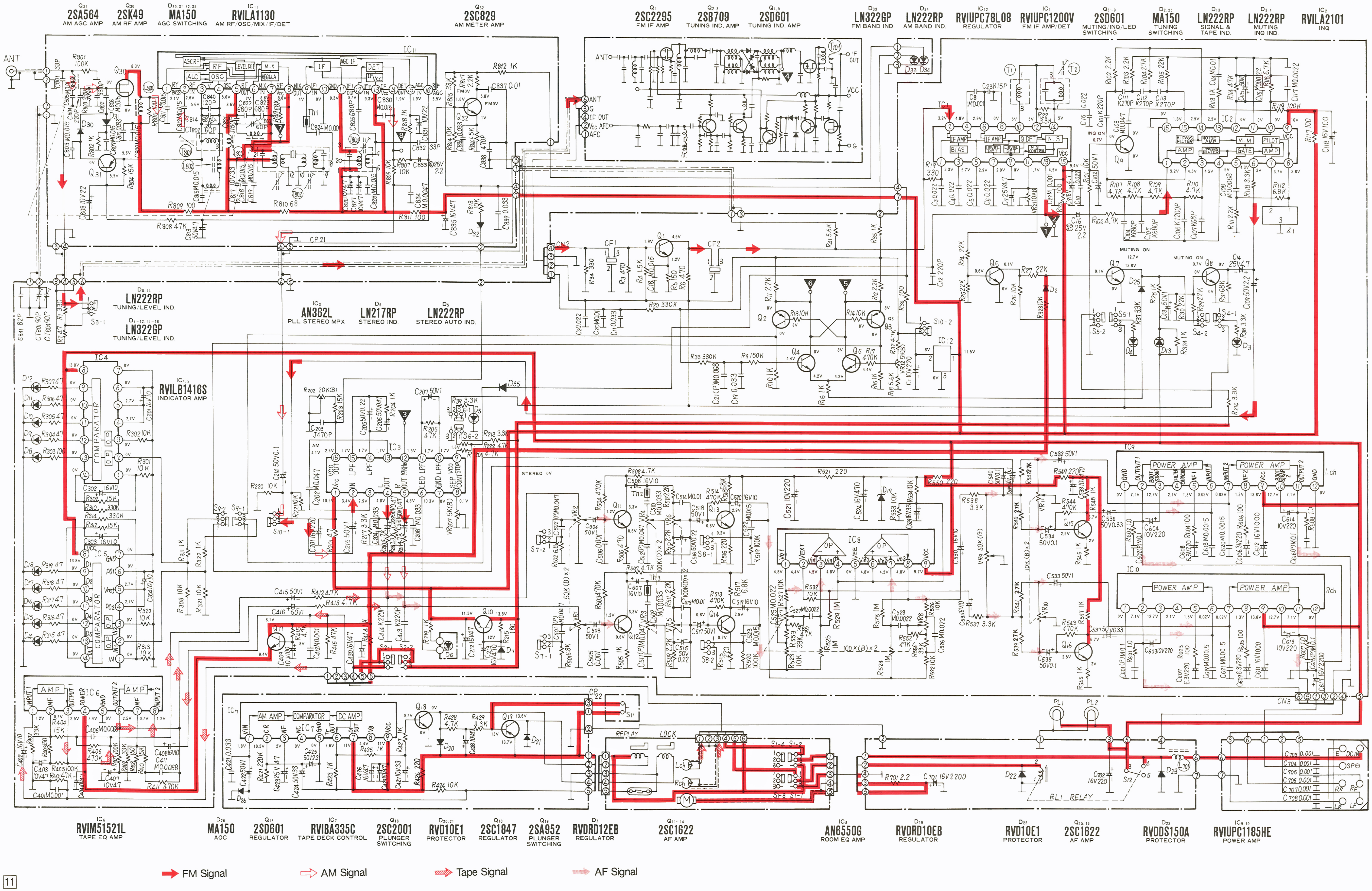
MUTING ALIGNMENT

SIGNAL GENERATOR or SWEEP GENERATOR		DIAL SETTING	DC VTVM	ADJUSTMENT	REMARKS
CONNECTIONS	FREQUENCY				
Connect to antenna terminal through FM dummy antenna (Refer to Fig.22.)	98 MHz (30% Mod.)	Tune to signal.	Output meter across speaker voice coil.	VR_{21}	① Tune signal to obtain maximum output. ② Set signal generator output to 60 dB. ③ Turn volume control so that DC VTVM reading becomes 0.45 V. ④ Set signal generator output to −10 dB. ⑤ Turn VR_{21} so that DC VTVM reading becomes 0.017～0.022 V.

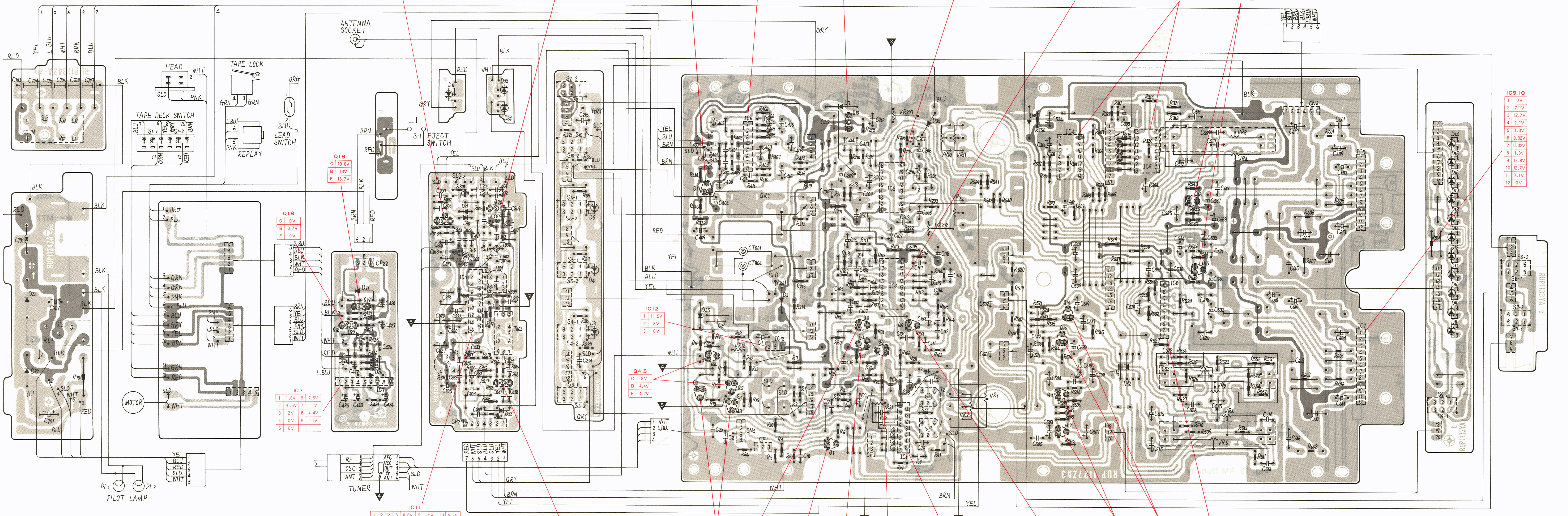
LED METER ALIGNMENT (See Fig. 17)

SIGNAL GENERATOR or SWEEP GENERATOR		DIAL SETTING	DC VTVM (Center 0)	ADJUSTMENT	REMARKS
CONNECTIONS	FREQUENCY				
Connect to antenna socket through FM dummy antenna.	98 MHz	Tune to signal.	Positive side to point ▼6. Negative side to point ▼5.	VR_{12}	① Tune signal to obtain maximum output. ② Set signal generator output to 60 dB. ③ Turn VR_{12} so that DC VTVM reading becomes 0.

SCHEMATIC DIAGRAM–MODEL RM-310


Q31 2SA564 AM AGC AMP
Q30 2SK49 AM RF AMP
D30,31,32,35 MA150 AGC SWITCHING
IC11 RVILA1130 AM RF/OSC/MIX/IF/DET
Q32 2SC829 AM METER AMP
Q1 2SC2295 FM IF AMP
Q2,3 2SB709 TUNING IND. AMP
Q4,5 2SD601 TUNING IND. AMP
D33 LN322GP FM BAND IND.
D34 LN222RP AM BAND IND.
IC12 RVIUPC78L08 REGULATOR
IC1 RVIUPC1200V FM IF AMP/DET
Q6~9 2SD601 MUTING/INQ/LED SWITCHING
D2,25 MA150 TUNING SWITCHING
D13 LN222RP SIGNAL & TAPE IND.
D3,4 LN222RP MUTING INQ IND.
IC2 RVILA2101 INQ
ANT
D8,14 LN222RP TUNING/LEVEL IND.
D9~12,15~18 LN322GP TUNING/LEVEL IND.
IC3 AN362L PLL STEREO MPX
D6 LN217RP STEREO IND.
D5 LN222RP STEREO AUTO IND.
IC4,5 RVILB1416S INDICATOR AMP
IC9 POWER AMP
IC10 POWER AMP
IC8
IC7 AM AMP COMPARATOR DC AMP
IC6 AMP
REPLAY
LOCK
RL1 RELAY
PL1
PL2
CN3
IC6 RVIM51521L TAPE EQ AMP
D26 MA150 AOC
Q17 2SD601 REGULATOR
IC7 RVIBA335C TAPE DECK CONTROL
Q18 2SC2001 PLUNGER SWITCHING
D20,21 RVD10E1 PROTECTOR
Q10 2SC1847 REGULATOR
Q19 2SA952 PLUNGER SWITCHING
D7 RVDRD12EB REGULATOR
Q11~14 2SC1622 AF AMP
IC8 AN6550G ROOM EQ AMP
D19 RVDRD10EB REGULATOR
D22 RVD10E1 PROTECTOR
Q15,16 2SC1622 AF AMP
D23 RVDDS150A PROTECTOR
IC9,10 RVIUPC1185HE POWER AMP
➡ FM Signal
⇨ AM Signal
▨ Tape Signal
⇨ AF Signal

CIRCUIT BOARD CONDUCTOR SIDE-MODEL RM-310


ANTENNA SOCKET
HEAD
TAPE LOCK
TAPE DECK SWITCH
LEAD SWITCH
REPLAY
EJECT SWITCH
S11
MOTOR
TUNER
RF
OSC
ANT
AFC
Vcc
OUT
PILOT LAMP
PL1
PL2
DC IN
RUP1134ZA
RUP1127ZA3
RUP1133YA
CP22
CT801
CT804
VR1
VR2
TH1
TH2
RED
BLK
WHT
YEL
BLU
L.BLU
BRN
GRN
GRY
ORG
PNK
SLD

Q31

C	0V
B	5.5V
E	5.6V

Q30

D	8.3V
G	0V
S	0V

Q17

C	8.1V
B	8V
E	7.4V

IC6

1	1.2V	5	0V
2	0.7V	6	2.5V
3	2.5V	7	0.7V
4	7.4V	8	1.2V

Q10

C	13.8V
B	12V
E	11.5V

IC3 ( )…AM ⟨ ⟩…STEREO

1	10.5V	5	4.8V	9	1.6 ⟨0⟩ V	13	1.7V
2	3.4V	6	10.3V	10	1.7V	14	1.7V
3	2.9V	7	0V	11	1.7V	15	1.7V
4	4.8V	8	0.1V	12	1.5V	16	2.6 (4.1) V

IC2

1	5.2V	5	4.3V	9	10V	13	2.5V
2	4.5V	6	3V	10	0V	14	2.5V
3	4.5V	7	3.7V	11	0V	15	1.8V
4	5V	8	3.8V	12	0V	16	0V

IC4, 5

1	0V	8	13.8V
2	0V	9	0V
3	0V	10	0V
4	2.7V	11	0V
5	2.7V	12	0V
6	0V	13	0V
7	0V	14	0V

Q15, 16

C	6.7V
B	2.5V
E	2V

IC9, 10

1	0V
2	7.1V
3	12.7V
4	2.1V
5	1.3V
6	0.02V
7	0.02V
8	1.3V
9	13.8V
10	12.7V
11	7.1V
12	0V

Q19

C	13.6V
B	13V
E	13.7V

Q18

C	0V
B	0.7V
E	0V

IC7

1	1.8V	6	7.6V
2	10.5V	7	11V
3	2V	8	4.4V
4	0V	9	11V
5	0V		

IC12

1	11.5V
2	8V
3	0V

Q4, 5

C	8V
B	4.4V
E	4.2V

IC11

1	2.1V	5	8.6V	9	4V	13	9.3V
2	2.6V	6	2V	10	0V	14	1.9V
3	5.6V	7	8.6V	11	9.3V	15	1.9V
4	5.6V	8	8.6V	12	0.7V	16	5.5V

Q32 ( )…FM

C	5.8 (0) V
B	1.6 (0) V
E	1 (0) V

Q2, 3

C	0V
B	8V
E	8V

Q8 …MUTING ON

C	0V
B	0 (0.7) V
E	0V

Q1

C	4.5V
B	1.9V
E	1.2V

Q7

C	13.8V
B	0.1V
E	0V

Q6

C	0.1V
B	0.6V
E	0V

IC1

1	3.3V	6	2.9V	11	1.7V
2	3.2V	7	2.9V	12	5V
3	5.7V	8	0V	13	4.5V
4	4.8V	9	0V	14	5V
5	2.9V	10	5V	15	9.4V

Q9 ( )…ING ON

C	0V
B	0.7 (0) V
E	0V

Q11, 12

C	3.3V
B	1.2V
E	0.6V

Q13, 14

C	2.9V
B	0.8V
E	0.2V

IC8

1	4.8V	6	4.8V
2	4.4V	7	4.5V
3	4.5V	8	4.8V
4	4.8V	9	9.7V
5	0V		

STEREO ALIGNMENT (See Fig. 17)

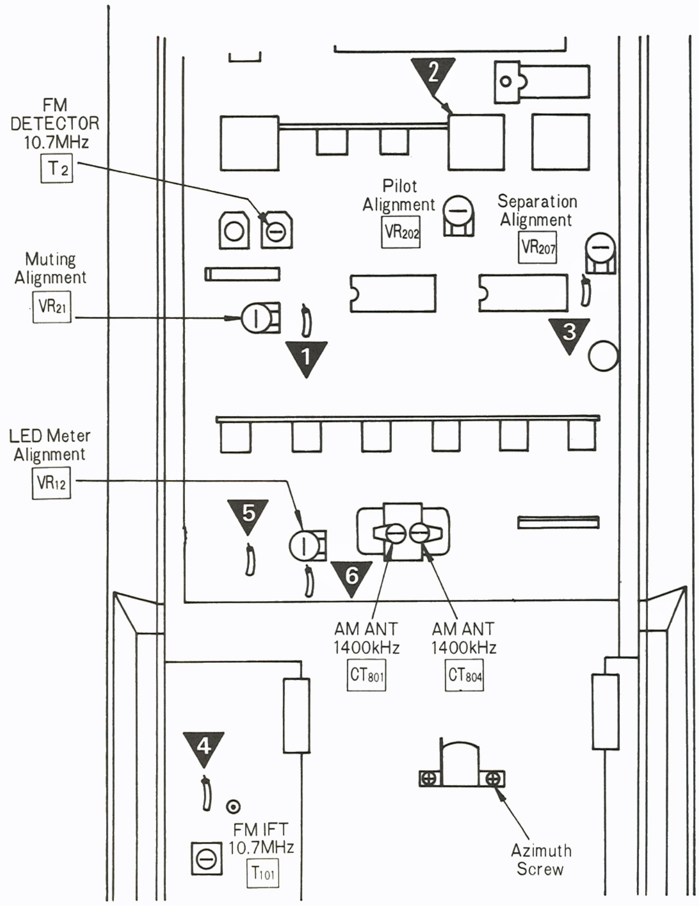
Notes: 1. Stereo modulator .... ● Connect stereo modulator output to EXT MOD terminal of signal generator.
● Pilot signal modulation to "10%"
2. FM signal generator .... ● Frequency approximatery 100 MHz/Output level to "60~70 dB"
● Modulation mode to "FM"

SIGNAL GENERATOR	FREQUENCY COUNTER	AC VTVM	ADJUSTMENT	REMARKS
		PILOT ALIGNMENT		
—	Positive to point ▼3. Negative side to earth.	—	VR202	Adjust for 19.00 kHz ±100 Hz reading on frequency counter.
		SEPARATION ALIGNMENT		
Connect to antenna socket.	—	Output meter across speaker voice coil.	VR207	● Tuner at 100 MHz ● Adjust for maximum separation. Right channel output at minimum when left channel is modulated. Left channel output at minimum when right channel is modulated.

AZIMUTH ALIGNMENT (See Fig. 17)

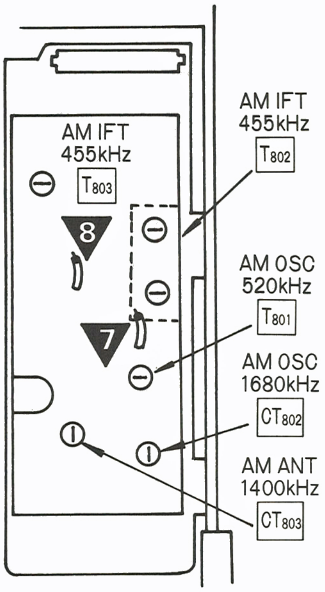
TAPE	ADJUSTMENT	REMARKS
Playback the azimuth tape.	Azimuth screw.	Adjust for maximum output (L, R ch).

■ ALIGNMENT POINTS



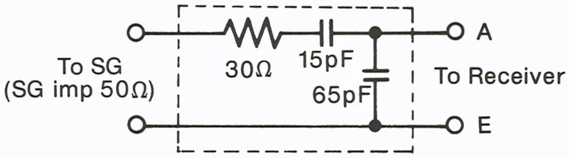
FM DETECTOR 10.7MHz
T2
Muting Alignment
VR21
LED Meter Alignment
VR12
2
Pilot Alignment
VR202
Separation Alignment
VR207
1
3
5
6
AM ANT 1400kHz
CT801
AM ANT 1400kHz
CT804
4
FM IFT 10.7MHz
T101
Azimuth Screw

Fig. 17



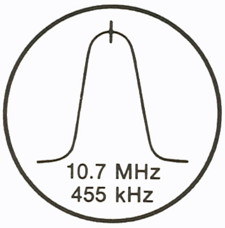
AM IFT 455kHz
T803
8
7
AM IFT 455kHz
T802
AM OSC 520kHz
T801
AM OSC 1680kHz
CT802
AM ANT 1400kHz
CT803

Fig. 18



A
To SG
(SG imp 50Ω)
30Ω
15pF
65pF
To Receiver
E

Fig. 19 AM Dummy Antenna



10.7 MHz
455 kHz

Fig. 20

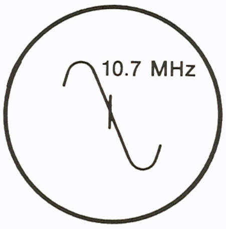
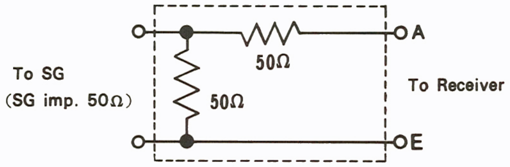


Fig. 21



To SG
(SG imp. 50Ω)
50Ω
50Ω
A
To Receiver
E

Fig. 22 FM Dummy Antenna

CASSETTE TAPE MECHANISM EXPLODED VIEWS

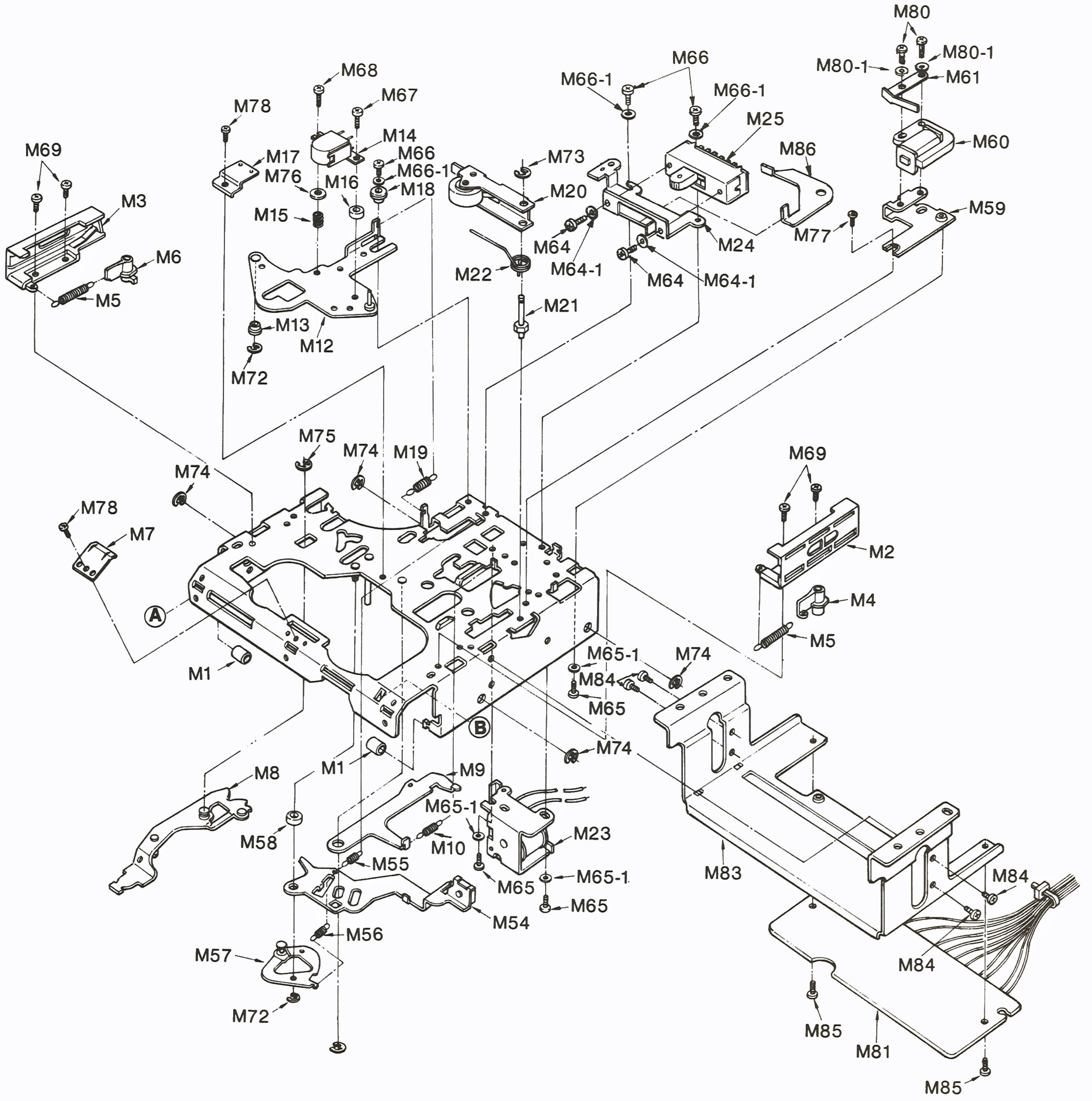

M80
M80-1
M80-1
M61
M68
M66-1
M66
M66-1
M67
M78
M14
M25
M60
M69
M17
M76
M66
M66-1
M16
M18
M73
M86
M3
M20
M15
M59
M6
M64
M64-1
M24
M77
M22
M64
M64-1
M5
M21
M13
M12
M72
M75
M74
M19
M69
M74
M78
M7
M2
A
M4
M5
M1
M65-1
M74
M84
M65
B
M74
M8
M1
M9
M65-1
M23
M58
M10
M55
M65-1
M65
M83
M84
M65
M54
M56
M57
M84
M72
M85
M81
M85

Fig. 23

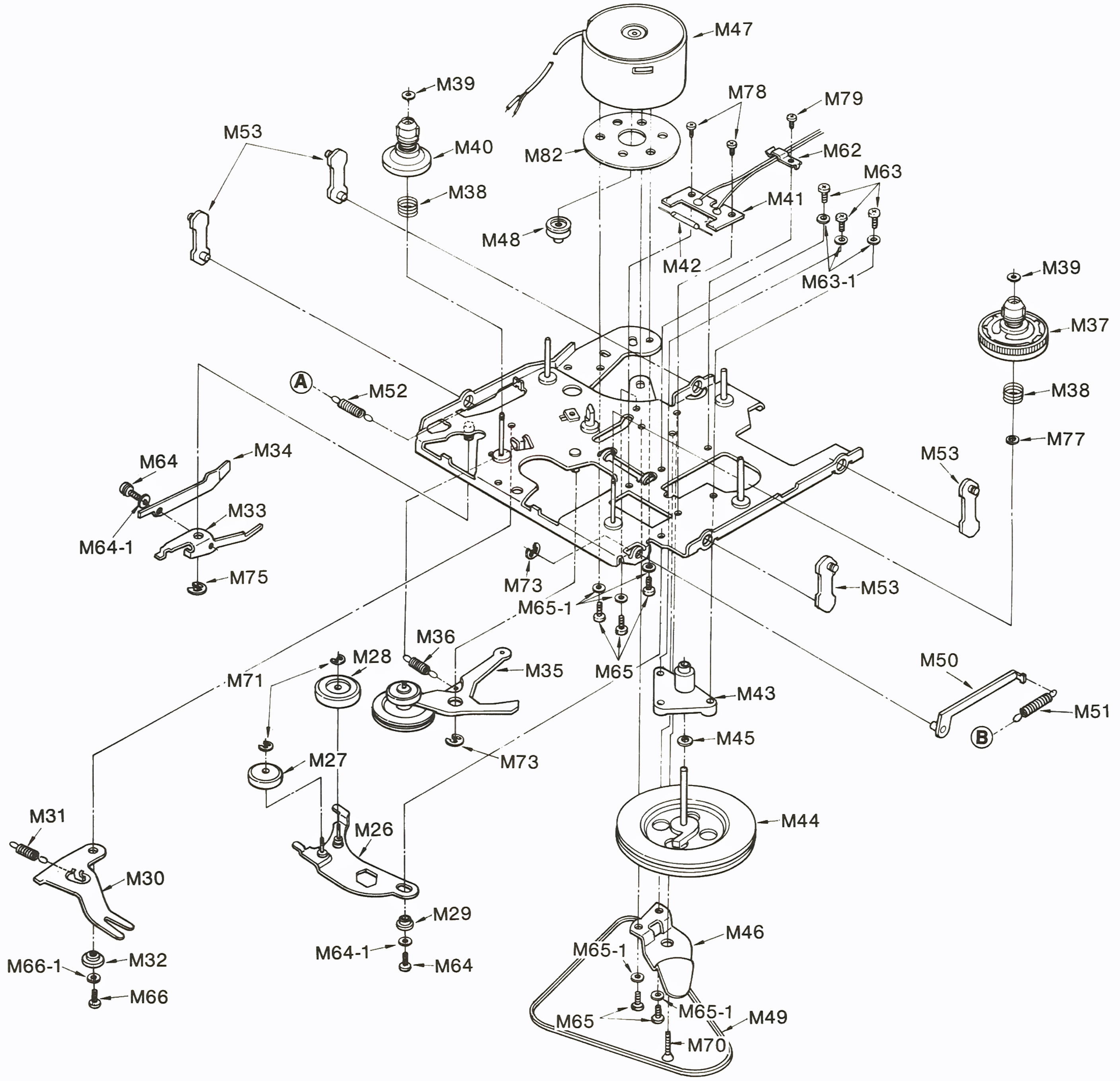

M47
M39
M78
M79
M53
M40
M82
M62
M38
M63
M41
M48
M42
M63-1
M39
M37
A
M52
M38
M77
M64
M34
M53
M33
M64-1
M75
M73
M53
M65-1
M36
M28
M35
M65
M50
M71
M43
M51
M73
M45
B
M27
M26
M44
M31
M30
M29
M46
M32
M64-1
M64
M65-1
M66-1
M66
M49
M65
M65-1
M70

Fig. 24

CABINET PARTS LOCATIONS

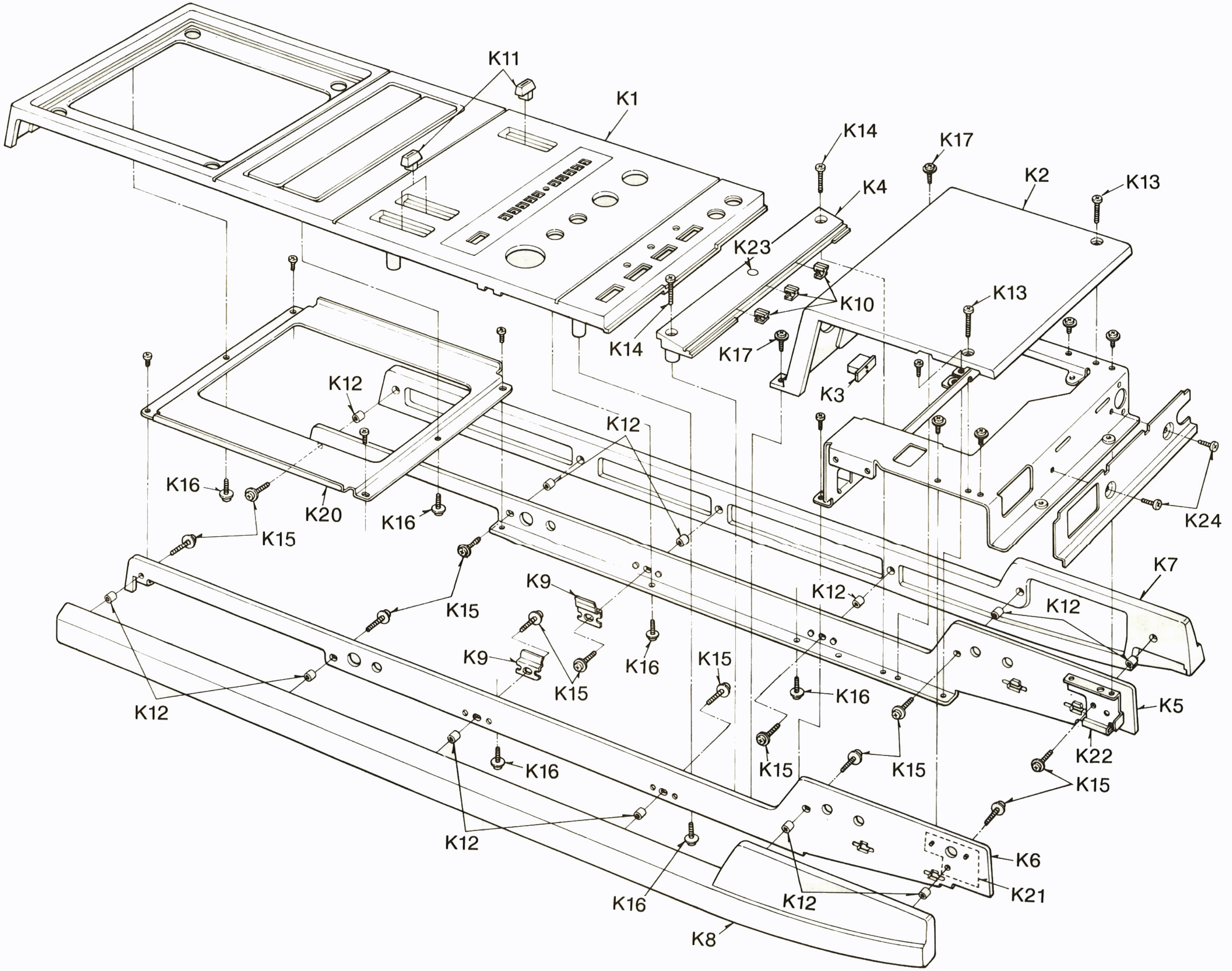

K11
K1
K14
K17
K2
K13
K4
K23
K10
K13
K14
K17
K3
K12
K12
K16
K20
K16
K15
K24
K7
K9
K12
K12
K15
K9
K16
K15
K15
K5
K16
K12
K22
K16
K15
K15
K15
K12
K6
K21
K16
K12
K8

Fig. 25

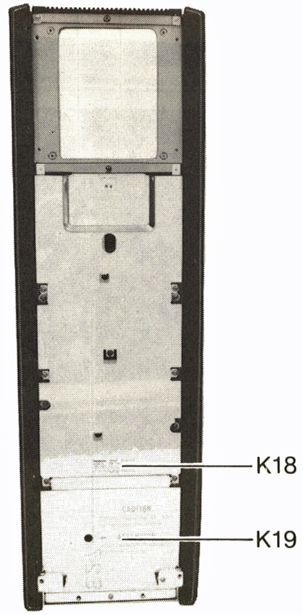


Fig. 26

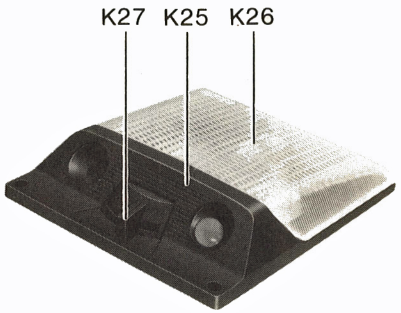


Fig. 27

CHASSIS PARTS LOCATIONS

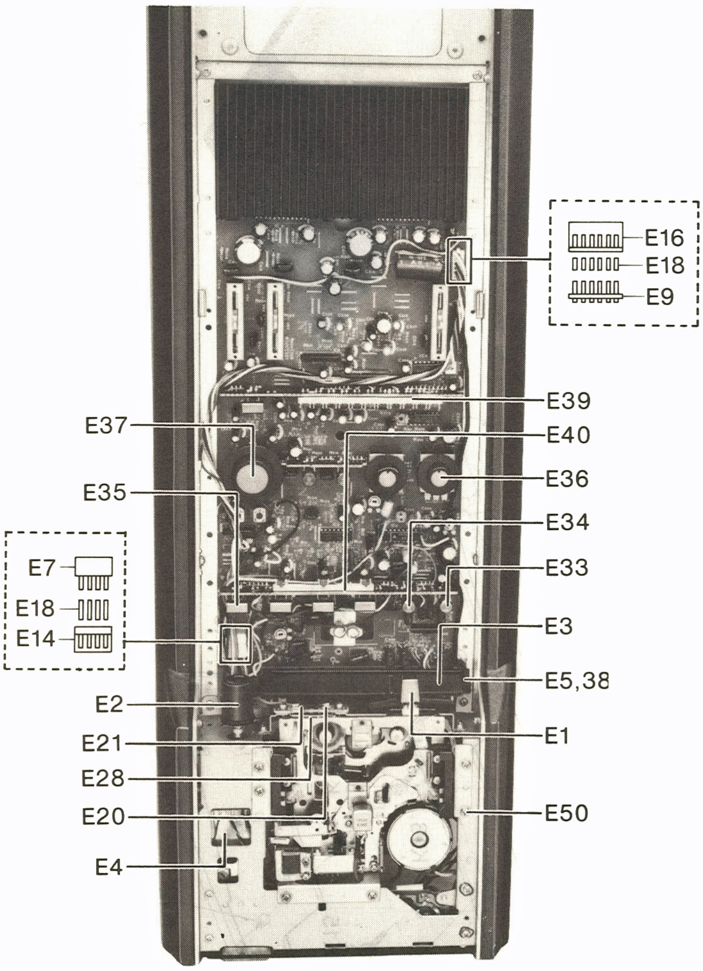

E16
E18
E9
E39
E40
E37
E36
E35
E34
E7
E33
E18
E14
E3
E5,38
E2
E1
E21
E28
E20
E50
E4

Fig. 28

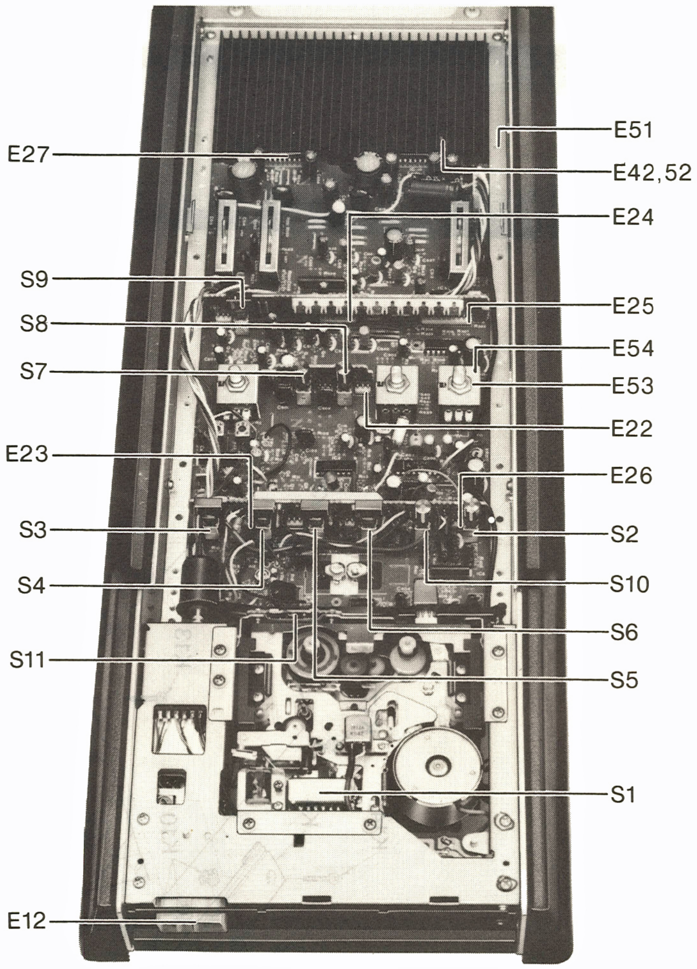

E51
E27
E42,52
E24
S9
E25
S8
E54
S7
E53
E22
E23
E26
S3
S2
S4
S10
S6
S11
S5
S1
E12

Fig. 29

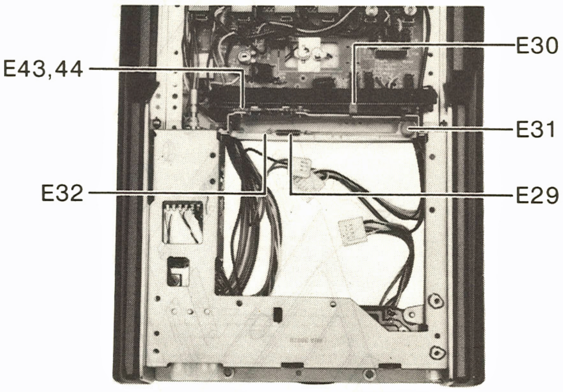

E30
E43,44
E31
E32
E29

Fig. 31

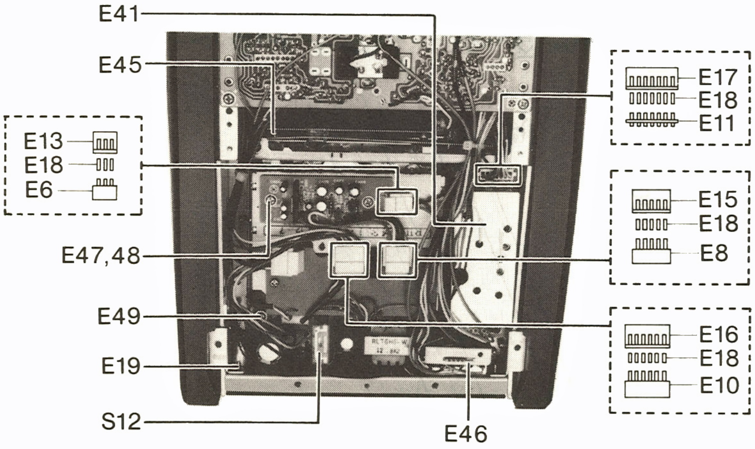

E41
E45
E17
E18
E11
E13
E18
E6
E15
E18
E8
E47,48
E49
E16
E18
E10
E19
S12
E46

Fig. 30

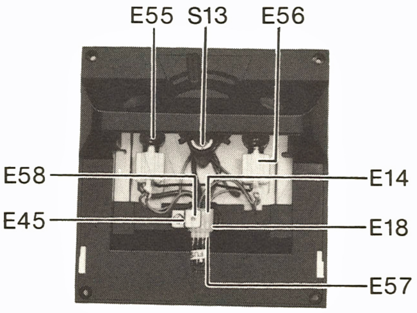

E55
S13
E56
E58
E14
E45
E18
E57

Fig. 32

PACKING MATERIALS

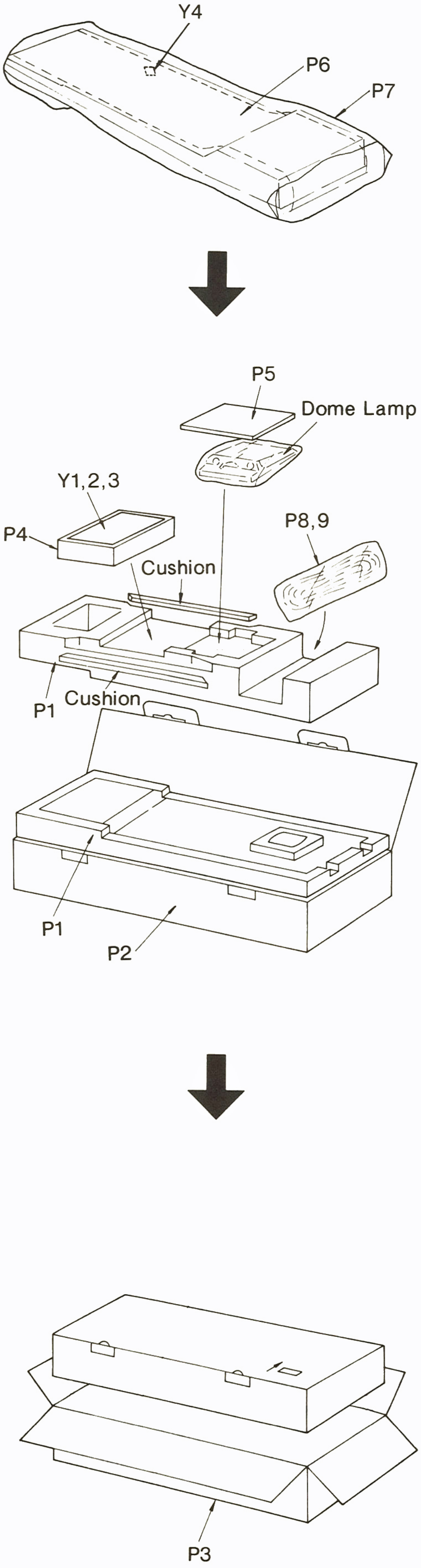
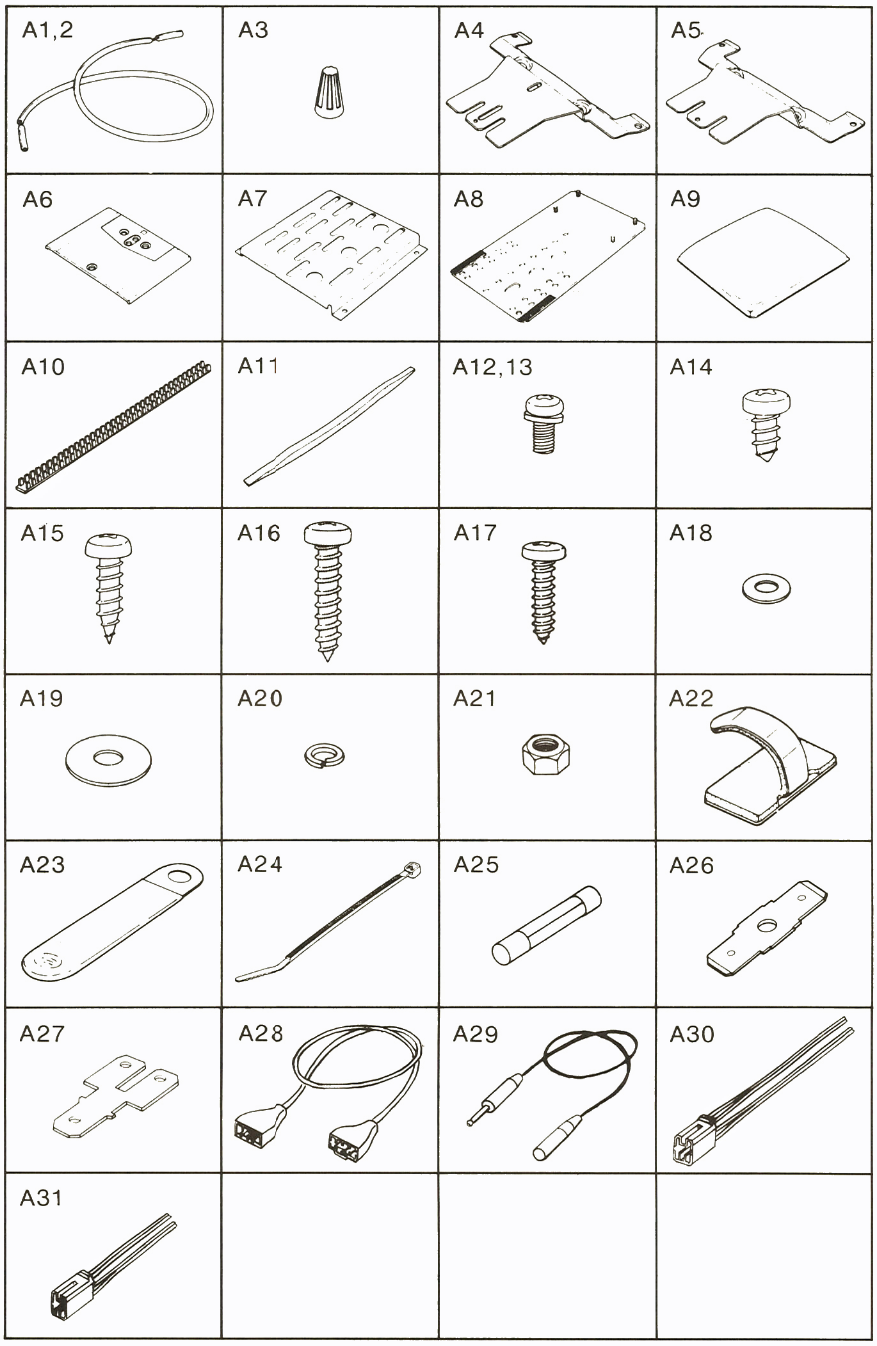
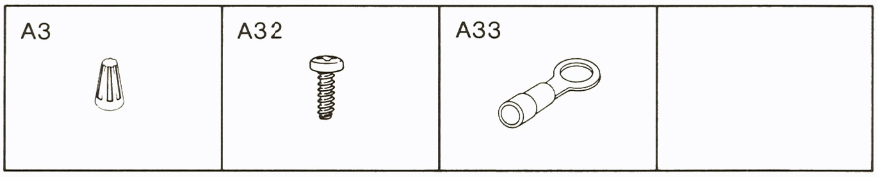

Y4
P6
P7
P5
Dome Lamp
Y1,2,3
P4
P8,9
Cushion
P1
Cushion
P1
P2
P3

Fig. 33

OVER-HEAD CONSOLE UNIT ACCESORIES


A1,2
A3
A4
A5
A6
A7
A8
A9
A10
A11
A12,13
A14
A15
A16
A17
A18
A19
A20
A21
A22
A23
A24
A25
A26
A27
A28
A29
A30
A31

DOME LAMP ACCESSORIES



TECHNICAL EXPLANATION

1. Muting circuitry

The noise heard when an FM broadcast is detuned is especially irritating to hear, as is a broadcast station which has a high noise level because of insufficient reception input.
Model RM-310 is designed so that the FM AF signal is muted when reception input is insufficient and when it is tuned to a frequency between FM broadcast stations.
This function is performed by the muting circuitry described below.

Explanation of operation

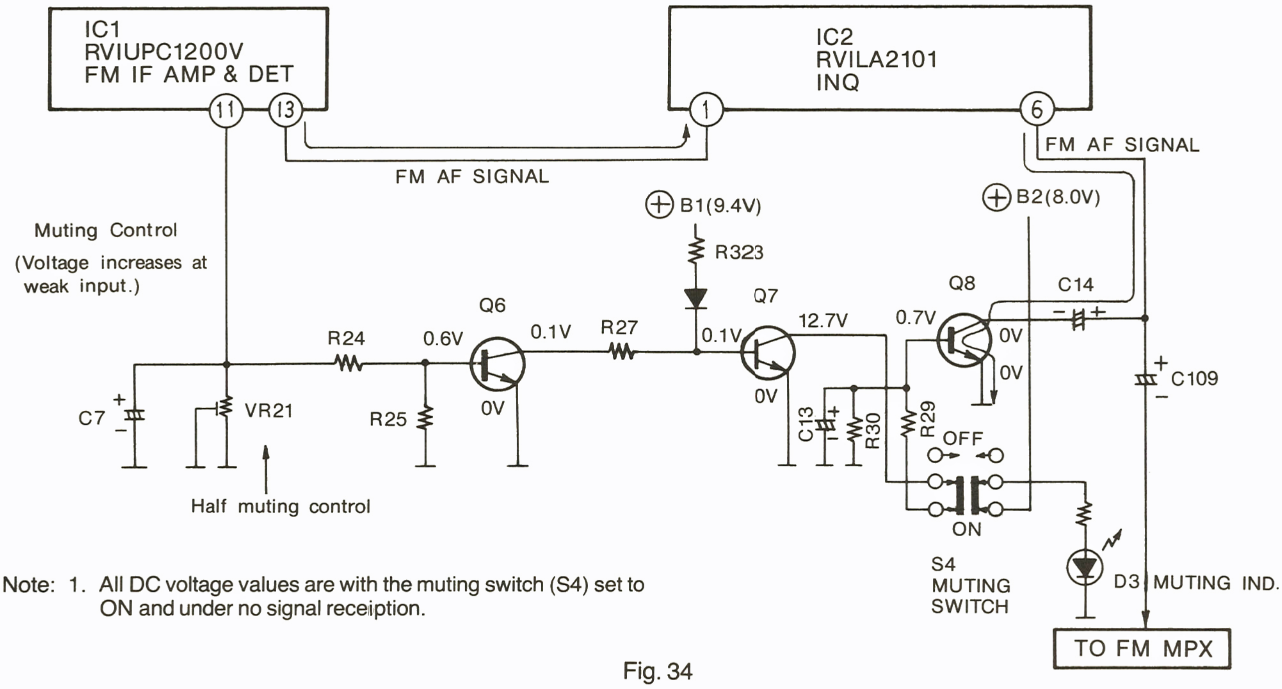
(1) When, in the circuitry diagram shown below, the reception input begins to decrease, the muting-control voltage (detection of reception input level) of pin ⑪ of IC1 increases, is applied to the base of Q6, Q6 becomes on, and the collector potential of Q6 decreases.

(2) Q7 becomes off when Q6 becomes on, and, as a result, the base potential of Q8 increases, causing Q8 to become on.

(3) As a result, there is then a short-circuit between the collector and emitter of Q8, and the FM AF output from pin ⑥ of IC2 passes through the collector-emitter of Q8 to ground, thus resulting in the muting of the signal.

Half-Muting Effect

The IC (PVIUPC 1200 V) for the FM IF amplifier and detector in the circuitry diagram below functions to reduce the noise level during reception of weak signals. This is useful to reduce the noise which occurs because of changes in the strength of the electric field when, for example, the vehicle passes between high buildings. (VR21 is a semi-fixed resistor for adjustment of operational sensitivity.)



IC1
RVIUPC1200V
FM IF AMP & DET
11
13
IC2
RVILA2101
INQ
1
6
FM AF SIGNAL
FM AF SIGNAL
B1(9.4V)
B2(8.0V)
R323
Muting Control
(Voltage increases at weak input.)
Q6
Q7
Q8
C14
R24
0.6V
0.1V
R27
0.1V
12.7V
0.7V
0V
0V
C109
C7
VR21
R25
0V
0V
C13
R30
R29
OFF
ON
Half muting control
S4
MUTING
SWITCH
D3
MUTING IND.
TO FM MPX

Note: 1. All DC voltage values are with the muting switch (S4) set to ON and under no signal receiption.

Fig. 34

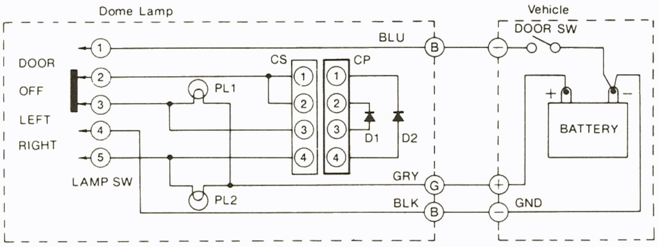
2. Dome Lamp

The Dome Lamp included in the RM-310, when properly wired to the vehicle, may be controlled in the following ways by switching.

(1) The lamps illuminate only when the doors are opened
(2) Only the lamp on the left side illuminates
(3) Only the lamp on the right side illuminates
(4) The lamps are off

Method of wiring to the vehicle

(1) For GM vehicles (with the door switch on the negative side of the battery)

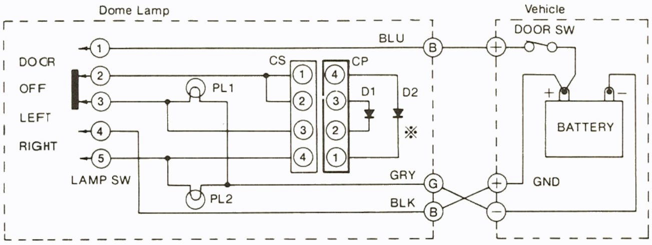


Dome Lamp
Vehicle
DOOR SW
DOOR
OFF
LEFT
RIGHT
LAMP SW
CS
CP
PL1
PL2
D1
D2
BLU
GRY
BLK
BATTERY
GND

Fig. 35

Note: On some models, the positive line from the battery is not wired to the dome lamps. For these models, the positive line should be wired directly from the battery.

(2) For Ford vehicles (with the door switch on the positive side of the battery)



Dome Lamp
Vehicle
DOOR SW
DOOR
OFF
LEFT
RIGHT
LAMP SW
CS
CP
PL1
PL2
D1
D2
※
BLU
GRY
BLK
BATTERY
GND

Fig. 36

Notes:
- ●On Ford vehicles, insert the diode plugs in the opposite direction (as indicated by the ※ mark in the above figure).
- ●On some models, the negative line from the battery is not wired to the dome lamps. For these models, the negative line should be wired directly from the battery.

■ REPLACEMENT PARTS LIST ……………………………Model RM-310

(RD81081902C2)

NOTES: 1. Important safety notice.
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.
2. The S mark indicates service standard parts and may differ from production parts.

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
		MECHANICAL PARTS		
M1	RFI4Z	Cushion	2	
M2	RFE17Z	Cassette Guide (R)	1	
M3	RFE18Z	Cassette Guide (L)	1	
M4	RFE9Z	Push Arm (R)	1	
M5	RFS37Z	Push Arm Spring	2	
M6	RFE10Z	Push Arm (L)	1	
M7	RFS38Z	Spring	1	
M8	RFY1Z	FF/Rewind Lever	1	
M9	RFY2Z	Lock Arm	1	
M10	RFS39Z	Lock Arm Spring	1	
M12	RFY4Y	Head Plate	1	
M13	RFX1Z	Head Plate Spacer	1	
M14	RJH2P1Z	Head	1	
M15	RFS40Z	Head Spring	1	
M16	RFX2Z	Head Spacer	1	
M17	RFS41Z	Head Plate Spring	1	
M18	RFX3Z	Head Plate Spacer	1	
M19	RFS42Z	Head Plate Spring	1	
M20	RFR1X	Pinch Roller	1	
M21	RFD62Y	Pinch Roller Arm Shaft	1	
M22	RFS43X	Pinch Roller Spring	1	
M23	RFP9003Z	Plunger Assembly	1	
M24	RFD63Y	Switch Bracket	1	
M25	RFA8Z	Push Switch	1	
M26	RFY5Z	Idler Plate Assembly	1	
M27	RFK1Z	FF Idler Assembly	1	
M28	RFK2Z	Take Up Roller Assembly	1	
M29	RFX4Z	Idler Plate Metal	1	
M30	RFY6Z	FF Plate	1	
M31	RFS44Z	Spring	1	
M32	RFX5Z	FF Plate Spacer	1	
M33	RFY7Z	Rewind Lever	1	
M34	RFS45Z	Rewind Action Spring	1	
M35	RFY8Z	Rewind Arm Assembly	1	
M36	RFS46Z	Rewind Arm Spring	1	
M37	RFJ1Z	Take Up Reel Table Assembly	1	
M38	RFS47Z	Back Tension Spring	2	
M39	RFN12Z	Washer	2	
M40	RFJ2Z	Supply Reel Table Assembly	1	
M41	RFT1Z	PC Board	1	
M42	RFA9Z	Lead Switch	1	
M43	RFD64Z	Flywheel Metal	1	
M44	RFF4Z	Flywheel	1	
M45	RFN18Z	Washer	1	
M46	RFD65Z	Flywheel Retainer	1	
M47	MMS3NF2R	Motor	1	
M48	RFQ5Z	Motor Pulley	1	
M49	RFB5Z	Belt	1	
M50	RFY9Z	Lift Plate Assembly	1	
M51	RFS48Z	Lift Spring	1	
M52	RFS49Z	Sub Chassis Spring	1	
M53	RFY10Z	Arm	4	
M54	RFY11Y	Lock Lever Assembly	1	
M55	RFS50Y	Spring	1	
M56	RFS51Y	Spring	1	
M57	RFY12Z	Lock Plate Assembly	1	
M58	RFX6Z	Lock Spacer	1	
M59	RFD66Z	Core Bracket	1	
M60	RFD9004Z	Core Assembly	1	
M61	RFS52Z	Spring	1	
M62	RFD67Z	Cord Holder	1	
M63	XSN2+5	Screw	3	S
M63-1	XWA2B	Washer	3	S
M64	XSN2+4	Screw	4	S
M64-1	XWA2B	Washer	4	S
M65	XSN26+4	Screw	8	S
M65-1	XWA26B	Washer	8	S
M66	XSN26+5	Screw	4	S
M66-1	XWA2B	Washer	4	S
M67	XSN2+5	Screw	1	S
M68	XSN2+8	Screw	1	S
M69	XSN26+4	Screw	4	S
M70	XSS26+11	Screw	1	
M71	XUC12FT	Circlip	2	S
M72	XUC15FT	Circlip	2	S
M73	XUC2FT	Circlip	4	S
M74	XUC25FT	Circlip	4	S
M75	XUC3FT	Circlip	2	S
M76	XWG2	Washer	1	S
M77	RFN19Z	Washer	1	
M78	XSBR2+2FZ	Screw	5	
M79	XSB2+2FZ	Screw	1	
M80	XSN26+6	Screw	2	S
M80-1	XWA26B	Washer	2	S
M81	RFT2Y	Circuit Board	1	
M82	RFX7Z	Spacer	1	
M83	RFD68Y	Bracket	1	
M84	XSN3+3S	Screw	4	
M85	XTN3+6B	Screw	2	S
M86	RFS123Z	Spring, Switch	1	
		INTEGRATED CIRCUITS, TRANSISTORS AND DIODES		
IC1	RVIUPC1200V	IC	1	
IC2	RVILA2101	IC	1	
IC3	AN362L	IC	1	
IC4,5	RVILB1416S	IC	2	
IC6	RVIM51521L	IC	1	
IC7	RVIBA335C	IC	1	
IC8	AN6550G	IC	1	
IC9,10	RVIUPC1185HE	IC	2	
IC11	RVILA1130	IC	1	
IC12	RVIUPC78L08	IC	1	
Q1	2SC2295	Transistor (Si)	1	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
Q2,3	2SB709	Transistor (Ge)	2	
Q4~9,17	2SD601	" (Si)	7	
Q10	2SC1847	" (Si)	1	
Q11~16	2SC1622AD17	" (Si)	6	
Q18	2SC2001	" (Si)	1	
Q19	2SA952	" (Ge)	1	
Q30	2SK49	" (Si)	1	
Q31	2SA564	" (Ge)	1	
Q32	2SC829	" (Si)	1	
D2,25,26,30,31,32,35	MA161	Diode (Si)	7	S
D3,4,5,8,13,14,34	LN222RP	LED (Ga)	7	
D6	LN217RP	" (Ga)	1	
D7	RVDRD12FB	Diode (Si)	1	S
D9~12,15,16~18,33	LN322GP	LED (Ga)	9	
D19	RVDRD10EB	Diode (Si)	1	
D20~22	SM112	" (Si)	3	S
D23	RVDDS150A	" (Si)	1	
		DOME LAMP		
D1,2	SM112	Diode (Si)	2	S
		COILS AND TRANSFORMERS		
L701	RLT6H6	Coil, Chock	1	
T1	RLQM3301	Coil, IF	1	
T2	RLI4M101	IFT, FM	1	S
T801	RLO2M20	Oscillator Coil, AM	1	
T802	RLI7W104P	IFT, AM	1	S
T803	RLI2M204	" "	1	S
		VARIABLE RESISTORS		
VR1,2	EWKHBA011B54	Variable Resistor, 50kΩ (B)	1	
VR3~6	EVBV18D10D15	" 100kΩ (D)	2	
VR7,8	EVBV17D10B15	" 100kΩ (B)	1	
VR9	EVHRQA518G54	" 50kΩ (G)	1	
VR10,11	EWJ4EA011B14	" 10kΩ (B)	1	
VR12,207	EVNM4AA00B53	" 5kΩ (B)	2	S
VR21	EVNK4AA00B14	" 10kΩ (B)	1	S
VR202	EVNM4AA00B24	" 20kΩ (B)	1	
		VARIABLE CAPACITORS		
CT801, 804	ECV1ZW90X32	Trimmer Capacitor	2	
CT802, 803	ECV1ZW60X53N	"	2	
		CERAMIC FILTERS		
CF1,2	RVFGF10S12FR	Ceramic Filter	2	
		COMPONENT COMBINATIONS		
Z1	RXA1GYF064	Component Combination	1	
Z2	RJE74Z	"	1	
		THERMISTORS		
Th1	RRT202	Thermistor	1	
Th2,3	RRT302	"	2	
		SWITCHES		
S1	RFA8Z	Switch, Tape Deck Power	1	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
S2~10	RSH2B09Y	Switch, Power, Selector etc.	9	
S12	RSL27Y	" Power	1	
		DOME LAMP		
S13	RWSML610M	Switch, Lamp	1	
		RESISTORS (Value is in OHMS)		
R1	RRD18XK331	330 1/8W Chip	1	
R2	RRD18XK470	47 " "	1	
R3	RRD18XK471	470 " "	1	
R4	RRD18XK152	1.5 k " "	1	
R5	RRD18XK151	150 " "	1	
R6	RRD18XK471	470 " "	1	
R9	RRD18XK154	150 k " "	1	
R10	RRD18XK102	1 k " "	1	
R11	RRD18XK222	2.2 k " "	1	
R12	RRD18XK222	2.2 k " "	1	
R13	RRD18XK103	10 k " "	1	
R14	RRD18XK103	10 k " "	1	
R15	RRD18XK102	1 k " "	1	
R16	RRD18XK102	1 k " "	1	
R17	RRD18XK474	470 k " "	1	
R18	RRD18XK562	5.6 k " "	1	
R19	RRD18XK331	330 " "	1	
R20	RRD18XK334	330 k " "	1	
R22	RRD18XK332	3.3 k " "	1	
R23	RRD18XK101	100 " "	1	
R24	RRD18XK223	22 k " "	1	
R25	RRD18XK223	22 k " "	1	
R26	RRD18XK103	10 k " "	1	
R27	RRD18XK223	22 k " "	1	
R28	RRD18XK102	1 k " "	1	
R29	RRD18XK223	22 k " "	1	
R30	RRD18XK223	22 k " "	1	
R31	RRD18XK683	68 k " "	1	
R32	RRD18XK472	4.7 k " "	1	
R33	RRD18XK334	330 k " "	1	
R34	RRD18XK331	330 " "	1	
R35	ERD25TJ102	1 k 1/4W Carbon	1	S
R36	ERD25TJ101	100 " "	1	S
R37	ERD25TJ332	3.3 k " "	1	S
R38	ERD25TJ332	3.3 k " "	1	S
R39	ERD25TJ332	3.3 k " "	1	S
R41	ERD25TJ562	5.6 k " "	1	S
R101	RRD18XK103	10 k 1/8W Chip	1	
R102	RRD18XK222	2.2 k " "	1	
R103	RRD18XK222	2.2 k " "	1	
R104	RRD18XK272	2.7 k " "	1	
R105	RRD18XK223	22 k " "	1	
R106	RRD18XK472	4.7 k " "	1	
R107	RRD18XK472	4.7 k " "	1	
R108	RRD18XK472	4.7 k " "	1	
R109	RRD18XK472	4.7 k " "	1	
R110	RRD18XK472	4.7 k " "	1	
R111	RRD18XK222	2.2 k " "	1	
R112	RRD18XK682	6.8 k " "	1	
R113	RRD18XK102	1 k " "	1	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
R114	RRD18XK473	47 k 1/8W Chip	1	
R116	ERD25TJ682	6.8 k 1/4W Carbon	1	S
R117	RRD18XK101	100 1/8W Chip	1	
R118	RRD18XK332	3.3 k " "	1	
R119	RRD18XK104	100 k " "	1	
R201	RRD18XK470	47 " "	1	
R203	RRD18XK153	15 k " "	1	
R204	RRD18XK102	1 k " "	1	
R205	RRD18XK473	47 k " "	1	
R206	RRD18XK472	4.7 k " "	1	
R210	RRD18XK472	4.7 k " "	1	
R211	RRD18XK472	4.7 k " "	1	
R213	RRD18XK332	3.3 k " "	1	
R214	RRD18XK332	3.3 k " "	1	
R215	RRD18XK181	180 " "	1	
R217	RRD18XK332	3.3 k " "	1	
R218	RRD18XK332	3.3 k " "	1	
R219	RRD18XK102	1 k " "	1	
R220	ERD25TJ103	10 k 1/4W Carbon	1	S
R221	ERD25TJ103	10 k " "	1	S
R222	RRD18XK472	4.7 k 1/8W Chip	1	
R301	RRD18XK103	10 k " "	1	
R302	RRD18XK103	10 k " "	1	
R303	RRD18XK101	100 " "	1	
R304	RRD18XK470	47 " "	1	
R305	RRD18XK470	47 " "	1	
R306	RRD18XK470	47 " "	1	
R307	RRD18XK470	47 " "	1	
R308	RRD18XK103	10 k " "	1	
R309	RRD18XK153	15 k " "	1	
R310	RRD18XK334	330 k " "	1	
R311	RRD18XK102	1 k " "	1	
R312	RRD18XK153	15 k " "	1	
R313	RRD18XK103	10 k " "	1	
R314	RRD18XK334	330 k " "	1	
R315	RRD18XK101	100 " "	1	
R316	RRD18XK470	47 " "	1	
R317	RRD18XK470	47 " "	1	
R318	RRD18XK470	47 " "	1	
R319	RRD18XK470	47 " "	1	
R320	RRD18XK103	10 k " "	1	
R321	RRD18XK103	10 k " "	1	
R322	RRD18XK102	1 k " "	1	
R323	RRD18XK103	10 k " "	1	
R324	ERD25TJ102	1 k 1/4W Carbon	1	S
R401	RRD18XK473	47 k 1/8W Chip	1	
R402	RRD18XK333	33 k " "	1	
R403	RRD18XK151	150 " "	1	
R404	RRD18XK153	15 k " "	1	
R405	RRD18XK104	100 k " "	1	
R406	RRD18XK474	470 k " "	1	
R407	RRD18XK104	100 k " "	1	
R408	RRD18XK151	150 " "	1	
R409	RRD18XK333	33 k " "	1	
R410	RRD18XK153	15 k " "	1	
R411	RRD18XK474	470 k " "	1	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
R412	RRD18XK472	4.7 k 1/8W Chip	1	
R413	RRD18XK472	4.7 k " "	1	
R414	RRD18XK102	1 k " "	1	
R415	RRD18XK472	4.7 k " "	1	
R416	RRD18XK473	47 k " "	1	
R421	RRD18XK224	220 k " "	1	
R423	RRD18XK102	1 k " "	1	
R424	RRD18XK103	10 k " "	1	
R425	RRD18XK102	1 k " "	1	
R426	RRD18XK221	220 " "	1	
R427	RRD18XK102	1 k " "	1	
R428	RRD18XK472	4.7 k " "	1	
R429	RRD18XK332	3.3 k " "	1	
R501	RRD18XK682	6.8 k " "	1	
R502	RRD18XK682	6.8 k " "	1	
R503	RRD18XK474	470 k " "	1	
R504	RRD18XK474	470 k " "	1	
R505	RRD18XK471	470 " "	1	
R506	RRD18XK471	470 " "	1	
R507	RRD18XK472	4.7 k " "	1	
R508	RRD18XK472	4.7 k " "	1	
R509	RRD18XK222	2.2 k " "	1	
R510	RRD18XK222	2.2 k " "	1	
R511	RRD18XK223	22 k " "	1	
R512	RRD18XK223	22 k " "	1	
R513	RRD18XK474	470 k " "	1	
R514	RRD18XK474	470 k " "	1	
R515	RRD18XK221	220 " "	1	
R516	RRD18XK221	220 " "	1	
R517	RRD18XK682	6.8 k " "	1	
R518	RRD18XK682	6.8 k " "	1	
R519	RRD18XK104	100 k " "	1	
R520	RRD18XK104	100 k " "	1	
R521	RRD18XK221	220 " "	1	
R522	RRD18XK103	10 k " "	1	
R523	RRD18XK103	10 k " "	1	
R524	RRD18XK105	1 M " "	1	
R525	RRD18XK105	1 M " "	1	
R526	RRD18XK103	10 k " "	1	
R527	RRD18XK103	10 k " "	1	
R528	RRD18XK105	1 M " "	1	
R529	RRD18XK105	1 M " "	1	
R532	RRD18XK103	10 k " "	1	
R533	RRD18XK103	10 k " "	1	
R534	RRD18XK103	10 k " "	1	
R537	RRD18XK332	3.3 k " "	1	
R538	RRD18XK332	3.3 k " "	1	
R539	RRD18XK273	27 k " "	1	
R540	RRD18XK273	27 k " "	1	
R541	RRD18XK273	27 k " "	1	
R542	RRD18XK273	27 k " "	1	
R543	RRD18XK474	470 k " "	1	
R544	RRD18XK474	470 k " "	1	
R545	RRD18XK102	1 k " "	1	
R546	RRD18XK102	1 k " "	1	
R547	RRD18XK102	1 k " "	1	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
R548	RRD18XK102	1 k 1/8W Chip	1	
R549	RRD18XK221	220 " "	1	
R550	RRD18XK221	220 " "	1	
R551	RRD18XK473	47 k " "	1	
R552	RRD18XK473	47 k " "	1	
R553	RRD18XK333	33 k " "	1	
R554	RRD18XK333	33 k " "	1	
R601	ERD25TJ1R0	1 1/4W Carbon	1	S
R602	ERD25TJ1R0	1 " "	1	S
R603	ERD25TJ101	100 " "	1	S
R604	ERD25TJ101	100 " "	1	S
R605	ERD25TJ101	100 " "	1	S
R606	ERD25TJ101	100 " "	1	S
R607	ERD25TJ1R0	1 " "	1	S
R608	ERD25TJ1R0	1 " "	1	S
R701	ERX1ANJP2R2	2.2 1W Metal	1	
R801	RRD18XK104	100 k 1/8W Chip	1	
R802	RRD18XK102	1 k " "	1	
R803	RRD18XK334	330 k " "	1	
R804	RRD18XK153	15 k " "	1	
R805	RRD18XK101	100 " "	1	
R806	RRD18XK103	10 k " "	1	
R807	RRD18XK103	10 k " "	1	
R808	RRD18XK473	47 k " "	1	
R809	RRD18XK101	100 " "	1	
R810	RRD18XK680	68 " "	1	
R811	RRD18XK101	100 " "	1	
R812	RRD18XK102	1 k " "	1	
R813	RRD18XK103	10 k " "	1	
R814	RRD18XK103	10 k " "	1	
R815	RRD18XK333	33 k " "	1	
R816	RRD18XK152	1.5 k " "	1	
R817	RRD18XK222	2.2 k " "	1	
R818	RRD18XK102	1 k " "	1	
R819	RRD18XK683	68 k " "	1	
		CAPACITORS (Value is in MICRO FARADS except P.P=PICO FARADS)		
C1	ECEA1AS221	220 10V Electrolytic	1	S
C2	ECUX1H223ZF	0.022 50V Chip	1	
C3	ECUX1H223ZF	0.022 " "	1	
C4	ECUX1H223ZF	0.022 " "	1	
C5	ECUX1H223ZF	0.022 " "	1	
C6	ECUX1H223ZF	0.022 " "	1	
C7	ECEA25Z4R7	4.7 25V Electrolytic	1	S
C8	ECUX1H102MD	0.001 50V Chip	1	
C9	ECEA1ES470	47 25V Electrolytic	1	S
C10	ECUX1H223ZF	0.022 50V Chip	1	
C11	ECUX1H333ZF	0.033 " "	1	
C12	ECUX1H221KD	220 P " "	1	
C13	ECEA50Z1	1 " Electrolytic	1	S
C14	ECEA25Z4R7	4.7 25V "	1	S
C15	ECUX1H223ZF	0.022 50V Chip	1	
C16	ECEA25N2R2	2.2 25V Electrolytic	1	S
C18	ECUX1H153MD	0.015 50V Chip	1	
C19	ECUX1H333ZF	0.033 " "	1	
C20	ECUX1H103MD	0.01 " "	1	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
C21	ECQG05683MZ	0.068 50V Polyester	1	
C22	ECKD1H102MD	0.001 " Ceramic	1	
C23	ECCD1H150KC	15 p " "	1	
C101	ECUX1H221KD	220 p " Chip	1	
C102	ECEA50Z1	1 " Electrolytic	1	S
C103	ECQG05473MZ	0.047 " Polyester	1	
C104	ECUX1H681KD	680 p " Chip	1	
C105	ECUX1H681KD	680 p " "	1	
C106	ECQS1H122KZ	1200 p " Styrol	1	
C107	ECUX1H680KC	68 p " Chip	1	
C108	ECUX1H682MD	0.0068 " "	1	
C109	ECEA50Z2R2	2.2 " Electrolytic	1	S
C111	ECUX1H271KD	270 p " Chip	1	
C112	ECUX1H271KD	270 p " "	1	
C113	ECUX1H271KD	270 p " "	1	
C114	ECUX1H103MD	0.01 " "	1	
C115	ECEA50Z1	1 " Electrolytic	1	S
C116	ECUX1H222MD	0.0022 " Chip	1	
C117	ECKD1H222MD	0.0022 " Ceramic	1	
C118	ECEA1ES101	100 25V Electrolytic	1	S
C201	ECEA1CS221	220 16V "	1	S
C202	ECQG05473MZ	0.047 50V Polyester	1	
C203	ECQS05471JZ	470 p " Styrol	1	
C204	ECQG05333MZ	0.033 " Polyester	1	
C205	ECEA50ZR22	0.22 " Electrolytic	1	S
C206	ECEA50ZR47	0.47 " "	1	S
C207	ECEA50Z1	1 " "	1	S
C208	ECQG05333MZ	0.033 " Polyester	1	
C209	ECEA50ZR47	0.47 " Electrolytic	1	S
C210	ECEA50ZR47	0.47 " "	1	S
C212	ECEA1ES470	47 25V "	1	S
C213	ECEA1CSS471	470 16V "	1	S
C214	ECEA50ZR1	0.1 50V "	1	S
C215	ECEA50Z1	1 " "	1	S
C301	ECEA1HS100	10 " "	1	S
C302	ECEA1HS100	10 " "	1	S
C303	ECEA1HS100	10 " "	1	S
C304	ECEA1HS100	10 " "	1	S
C401	ECUX1H102MD	0.001 " Chip	1	
C402	ECEA1HS100	10 " Electrolytic	1	S
C403	ECEA1AS470	47 10V "	1	S
C404	ECEA1AS470	47 " "	1	S
C406	ECUX1H682MD	0.0068 50V Chip	1	
C407	ECEA1AS470	47 10V Electrolytic	1	S
C408	ECEA1HS100	10 50V "	1	S
C409	ECEA1AS101	100 10V "	1	S
C411	ECUX1H682MD	0.0068 50V Chip	1	
C412	ECUX1H102MD	0.001 " "	1	
C413	ECUX1H221KD	220 p " "	1	
C414	ECUX1H221KD	220 p " "	1	
C415	ECEA50Z1	1 " Electrolytic	1	S
C416	ECEA50Z1	1 " "	1	S
C421	ECUX1H333ZF	0.033 " Chip	1	
C422	ECEA1HK010	1 " Electrolytic	1	
C423	ECEA1EK4R7	4.7 25V "	1	
C424	ECEA1HK3R3	3.3 50V "	1	

Ref. No.	Part No.	Part Name & Description			Per Set	Remarks
C425	ECEA1HK2R2	2.2	50V	Electrolytic	1	
C426	ECEA1CK470	47	16V	"	1	
C427	ECEA1AK330	33	10V	"	1	
C428	ECEA1AK470	47	"	"	1	
C429	ECEA1CK470	47	16V	"	1	
C430	ECEA1ES470	47	25V	"	1	S
C501	ECQG05473MZ	0.047	50V	Polyester	1	
C502	ECQG05473MZ	0.047	"	"	1	
C503	ECEA50Z1	1	"	Electrolytic	1	S
C504	ECEA50Z1	1	"	"	1	S
C505	ECUX1H102ZF	0.001	"	Chip	1	
C506	ECUX1H102ZF	0.001	"	"	1	
C507	ECEA1HS100	10	"	Electrolytic	1	S
C508	ECEA1HS100	10	"	"	1	S
C509	ECUX1H332MD	0.0033	"	Chip	1	
C510	ECUX1H332MD	0.0033	"	"	1	
C511	ECQG05473MZ	0.047	"	Polyester	1	
C512	ECQG05473MZ	0.047	"	"	1	
C513	ECUX1H103MD	0.01	"	Chip	1	
C514	ECUX1H103MD	0.01	"	"	1	
C515	ECEA50ZR22	0.22	"	Electrolytic	1	S
C516	ECEA50ZR22	0.22	"	"	1	S
C517	ECEA50Z1	1	"	"	1	S
C518	ECEA50Z1	1	"	"	1	S
C519	ECEA1HS100	10	"	"	1	S
C520	ECEA1HS100	10	"	"	1	S
C521	ECEA1AS221	220	10V	"	1	S
C522	ECUX1H153MD	0.015	50V	Chip	1	
C523	ECUX1H153MD	0.015	"	"	1	
C524	ECEA1CSS471	470	16V	Electrolytic	1	S
C525	ECQG05223MZ	0.022	50V	Polyester	1	
C526	ECQG05223MZ	0.022	"	"	1	
C527	ECUX1H222MD	0.0022	"	Chip	1	
C528	ECUX1H222MD	0.0022	"	"	1	
C529	ECEA1CS330	33	16V	Electrolytic	1	S
C530	ECEA1HS100	10	50V	"	1	S
C531	ECEA1HS100	10	"	"	1	S
C532	ECEA50Z1	1	"	"	1	S
C533	ECEA50Z1	1	"	"	1	S
C534	ECEA50ZR1	0.1	"	"	1	S
C535	ECEA50ZR1	0.1	"	"	1	S
C536	ECEA50MR33	0.33	"	"	1	S
C537	ECEA50MR33	0.33	"	"	1	S
C538	ECEA1AS471	470	10V	"	1	S
C539	ECEA50ZR1	0.1	50V	"	1	S
C540	ECEA50ZR1	0.1	"	"	1	S
C601	ECQG05104MZ	0.1	50V	Polyester	1	
C602	ECQG05104MZ	0.1	"	"	1	
C603	ECEA1AS221	220	10V	Electrolytic	1	S
C604	ECEA1AS221	220	"	"	1	S
C607	ECEA1AS221	220	"	"	1	S
C608	ECEA1AS221	220	"	"	1	S
C609	ECEA1AS221	220	"	"	1	S
C610	ECEA1AS221	220	"	"	1	S
C611	ECEA1CSS102	1000	16V	"	1	S
C612	ECEA1CSS102	1000	"	"	1	S
C613	ECEA1AS221	220	10V	Electrolytic	1	S
C614	ECEA1AS221	220	"	"	1	S
C615	ECQG05104MZ	0.1	50V	Polyester	1	
C616	ECQG05104MZ	0.1	"	"	1	
C617	ECEA1CS222	2200	16V	Electrolytic	1	S
C618	ECUX1H152MD	0.0015	50V	Chip	1	
C619	ECUX1H152MD	0.0015	"	"	1	
C620	ECUX1H152MD	0.0015	"	"	1	
C621	ECUX1H152MD	0.0015	"	"	1	
C701	ECEA1CS222	2200	16V	Electrolytic	1	S
C702	ECEA1CS222	2200	"	"	1	S
C801	ECUX1H330KC	33 p	50V	Chip	1	
C802	ECUX1H331KD	330 p	"	"	1	
C803	ECUX1H153MD	0.015	"	"	1	
C804	ECUX1H221JD	220 p	"	"	1	
C805	ECUX1H103MD	0.01	"	"	1	
C806	ECUX1H153MD	0.015	"	"	1	
C807	ECUX1H153MD	0.015	"	"	1	
C808	ECEA1AK220	22	10V	Electrolytic	1	
C809	ECUX1H153MD	0.015	50V	Chip	1	
C810	ECUX1H333ZF	0.033	"	"	1	
C811	ECUX1H153MD	0.015	"	"	1	
C812	ECUX1H153MD	0.015	"	"	1	
C813	ECEA1HK4R7	4.7	"	Electrolytic	1	
C814	ECUX1H680JC	680 p	"	Chip	1	
C816	ECUX1H153MD	0.015	"	"	1	
C817	ECEA1AK330	33	10V	Electrolytic	1	
C818	ECUX1H153MD	0.015	50V	Chip	1	
C819	ECUX1H153MD	0.015	"	"	1	
C821	ECUX1H151JD	150 p	"	"	1	
C822	ECUX1H681KD	680 p	"	"	1	
C823	ECUX1H681KD	680 p	"	"	1	
C824	ECUX1H102MD	0.001	"	"	1	
C825	ECUX1H681KD	680 p	"	"	1	
C826	ECEA1AK470	47	10V	Electrolytic	1	
C827	ECEA1AK470	47	"	"	1	
C828	ECUX1H153MD	0.015	50V	Chip	1	
C830	ECUX1H153MD	0.015	"	"	1	
C831	ECEA1AK220	22	10V	Electrolytic	1	
C832	ECUX1H330KC	33 p	50V	Chip	1	
C833	ECEA25N2R2	2.2	25V	Electrolytic	1	
C834	ECUX1H472MD	0.0047	50V	Chip	1	
C835	ECEA1CK470	47	16V	Electrolytic	1	
C836	ECUX1H333ZF	0.033	50V	Chip	1	
C837	ECUX1H103MD	0.01	"	"	1	
C838	ECUX1H471KD	470 p	"	"	1	
C839	ECUX1H333ZF	0.033	"	"	1	
C840	ECCD1H121JC	120 p	"	Ceramic	1	
C841	ECCD1H820K	82 P	"	"	1	
		CABINET PARTS				
K1	RYP2M310M	Panel Assembly			1	
K2	RYP1M310XG	Deck Cover Assembly			1	
K3	RYT1M300N	Eject Button Assembly			1	
K4	RGP575Y	Panel, Ant. Trim Mark			1	
K5	RGX1008Z	Cabinet Frame, Right Side			1	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
K6	RGX1008Y	Cabinet Frame, Left Side	1	
K7	RGX1097Z	Ornament, Right Side	1	
K8	RGX1097Y	" Left Side	1	
K9	RUL596Z	Bracket, Panel	2	
K10	RDP208Z	Point, Dial	3	
K11	RBD63Z	Knob, Equalizer	3	
K12	RHM114Z	Spacer, Cabinet Frame	12	
K13	XTB3+10CFZ	Screw, Deck Cover M'tg	2	
K14	XTB3+16CFZ	" Panel (Ant. Trim) M'tg	2	
K15	XTW3+12F	" Cabinet Frame M'tg	12	
K16	XTW3+12FR	Red Screw, Panel M'tg	7	
K17	XTW3+8FR	" Deck Cover M'tg	2	
K18	RGT764W8	Name Plate	1	
K19	RQT4241X	Caution Sheet	1	
K20	RUA388Z	Rear Mounting Bracket	1	
K21	RUL595Z	Bracket, Cabinet Frame, Left	1	
K22	RUL595Y	" " Right	1	
K23	RHG307A	Cover, Ant. Trim	1	
K24	XTB3+8BFZ	Screw, Deck Bracket M'tg	2	
		DOME LAMP		
K25	RYMLM610M7	Cabinet Assembly, Dome Lamp	1	
K26	RGX1039Z	Lamp Cover	1	
K27	RBD107Z	Knob, Lamp Switch	1	
		ELECTRICAL PARTS		
E1	RYT2M300N	Button Assembly, FF, REW	1	
E2	RBN539Z	Knob, Tuning	1	
E3	RYEM310M	Dial Back Plate Assembly	1	
E4	RSD18Z	FM Tuner	1	
E5	XAMR50S400	Pilot Lamp, 12V, 0.03A	2	
E6	RJP133Z	Plug, 3 Pin, CP22	1	
E7	RJP134Z	" 4 Pin, CN2	1	
E8	RJP136Z	" 5 Pin	1	
E9	RJP142Z	" 6 Pin, CN3	1	
E10	RJP144Z	" 6 Pin,	1	
E11	RJP119Z	" 7 Pin, CP21	1	
E12	RJP204Z	" SP, Power	1	
E13	RJS253X	Socket, 3 Pin	1	
E14	RJS216X	" 4 Pin	2	
E15	RJS217X	" 5 Pin	2	
E16	RJS112X	" 6 Pin	2	
E17	RJS219X	" 7 Pin	1	
E18	RJT462Y	Terminal, Socket	40	
E19	RJS163Z	Socket, Antenna	1	
E20	RJT433Z	Terminal, Eject Switch	2	
E21	RJT663Z	Spring, Eject Switch	1	
E22	RJT665Z	Connector, 3 Pin, CN10∿12, 14∿16, 20	7	
E23	RJT666Z	Connector, 5 Pin, CN13	1	
E24	RJT667Z	" 7 Pin, CN19	1	
E25	RJT668Z	" 10 Pin, CN18	1	
E26	RJT671Z	" 4 Pin, CN17	1	
E27	RMX159Z	Insulator	2	
E28	RMX160Z	"	1	
E29	RDS3090A	Spring, Dial	1	
E30	RDP207Z	Pointer, Dial	1	
E31	RDR9008Z	Roller, Dial	3	
E32	RDZ05A	Cord, Dial	1 ROLL	
E33	RBC152Z	Button, Power	1	
E34	RBC152Y	" Band, Loudness etc.	3	
E35	RBC153Z	" Sens, Muting, etc.	5	
E36	RBN537Z	Knob, Balance, Fader	2	
E37	RBN538Z	" Volume	1	
E38	RHG219Z	Rubber, Pilot Lamp	2	
E39	RMP123Z	Holder, LED	1	
E40	RMP124Z	" "	1	
E41	RMC684Z	Shield Cover	1	
E42	XSN3+14BVS	Screw, Power IC M'tg	4	S
E43	XSN3+5S	" Deck, Eject Switch M'tg	4	S
E44	XWA3B	Washer	6	S
E45	XTN3+8B	Screw, Dial Back Plate etc. M'tg	15	S
E46	XTN3+10B	Screw, PC Board M'tg	1	S
E47	XSN3+6S	" Deck PC Board M'tg	2	S
E48	XWG3	Washer, Deck PC Board M'tg	2	S
E49	XTW3+6F	Screw, Pointer Guide etc. M'tg	19	
E50	XTW3+6FR	Red Screw, Tape Deck M'tg	6	
E51	XTW3+8F	Screw, Heat Sink M'tg	8	
E52	XWC3B	Washer	8	S
E53	XNS8D	Nut, Volume M'tg	3	
E54	RMR75Z	Bracket, Volume	3	
		DOME LAMP		
E55	XAMR70T	Dome Lamp	2	
E56	RJS205Y	Socket, Lamp	2	
E57	RJP107Z	Plug,	1	
E58	RUL408Z	Bracket, Socket	1	
		ACCESSORIES		
A1	WRRA-30XX	Dome Lamp Extension Wire	1	
A2	WRRH-30XX	"	1	
A3	RHR131Z	Wire Nut	12	
A4	RKC61Z	Front Mounting Plate	1	
A5	RKC61Y	"	1	
A6	RKE320Z	Front Plate Cover	1	
A7	RKC51X	Rear Mounting Plate	1	
A8	RYED61001M	Rear Extension Plate	1	
A9	RKE319Z	Padded Rear Cover	1	
A10	RHR980Z	Wire Protector	1	
A11	RHR1088Z	Foam Spacer	2	
A12	XSN4+8C	Screw	8	S
A13	XWA4B	Washer	8	S
A14	XTN5+12AFX	Self Tap Screw	2	
A15	XTN5+16B	"	2	S
A16	XTN5+20AFZ	"	2	
A17	XTB4+16AFN	"	1	
A18	XWG4	Flat Washer	8	S
A19	XWG5F16	"	6	S
A20	XWA5B	Lock Washer	4	S
A21	XNG5ES	Hex. Nut	4	S
A22	RME202Z	Wire Clamp	3	
A23	RME188Z	"	6	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
A24	RHR993Z	Wire Clamp	6	
A25	XBA1E60NS5	Fuse	2	
A26	RJT687Z	Male Adaptor Terminal	1	
A27	RJT686Z	Male Adaptor Terminal	1	
A28	RWAM310M	Power Cord Assembly	1	
A29	RJP177Z	Antenna Cord	1	
A30	RWN1M310M	Speaker Connector Assembly, (Front SP)	1	
A31	RWN2M310M	Speaker Connector Assembly, (Rear SP)	1	
A32	XTB3+10CFZ	Self Tap Screw	4	
A33	RJT218Z	Terminal	1	
		PACKING MATERIALS		
P1	RPN9344Z	Pad Complete	1	
P2	RPK1249Z	Gift Box	1	
P3	RPG2467Z	Carbon Box	1	
P4	RPK818Z	Box	1	
P5	RPN2927Z	Pad	1	
P6	RPH322Z	Soft Sheet	1	
P7	RPP258Z	Polyethylene Cover	1	
P8	XZB20X40A04	Polyethylene Cover	1	S
P9	XZB10X15A04	Polyethylene Cover	1	S
		PRINTED MATERIALS		
Y1	RQX6819Z	Instruction Book	1	
Y2	RQX9272Z	Instruction for Mounting	1	
Y3	RQX9257Z	Caution Sheet	1	
Y4	RQE18Z	Caution Tap	1	